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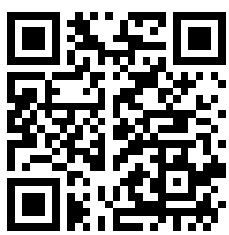

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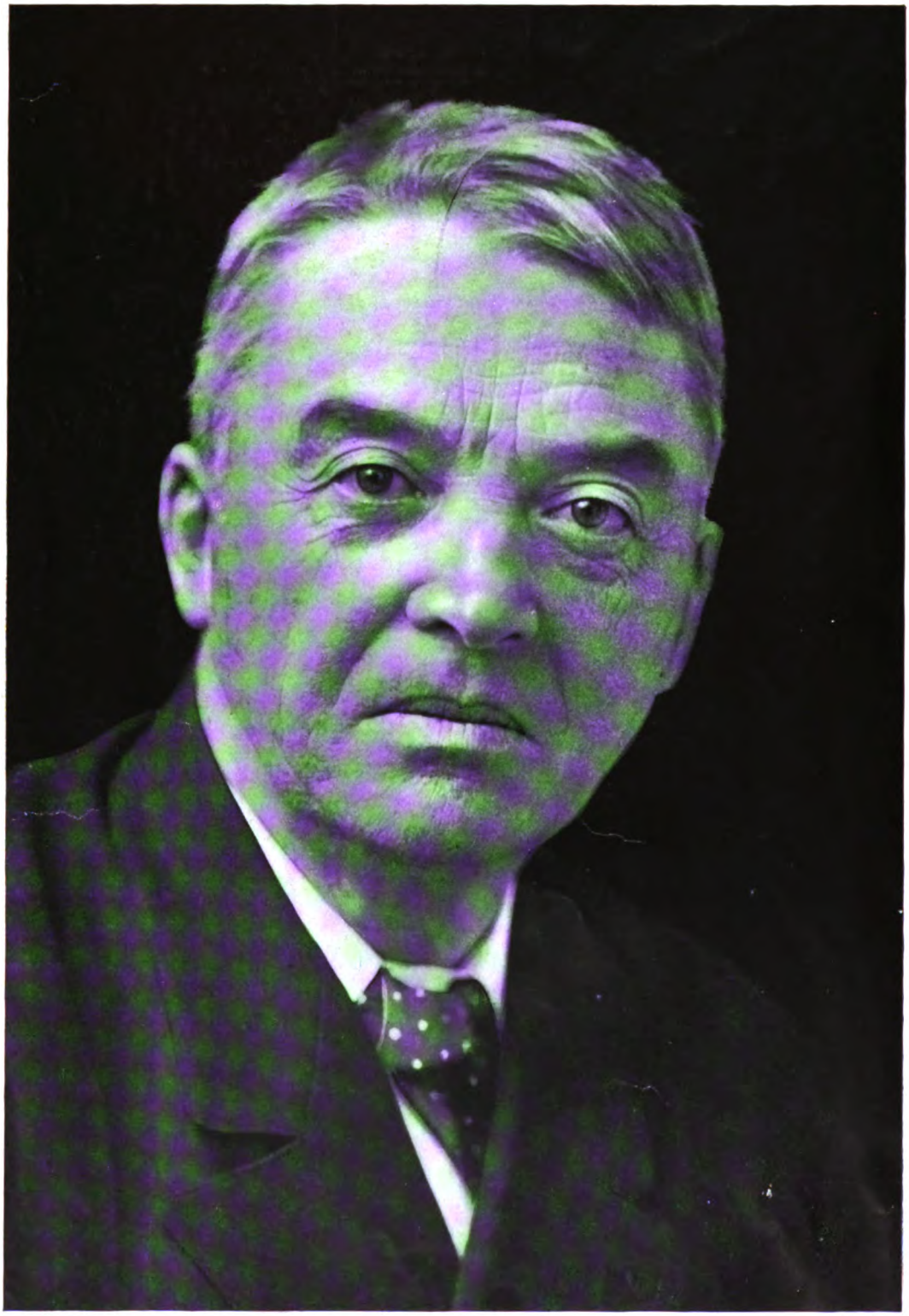

Beresford

ADMIRAL SIR JOHN ARBUTHNOT FISHER, G.C.B.

THE SENIOR SEA LORD OF THE ADMIRALTY, WHOSE POLICY FOR THE FUTURE OF OUR NAVY IS DESCRIBED ON PAGE 12

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The World's Work And Play

EDITED BY HENRY NORMAN, M.P.

VOL. V LONDON, DECEMBER 1904 No. 25

HOW OUR NAVY PREPARES FOR WAR

WHAT MIGHT HAVE BEEN—THE GRIM REALITY AS SUGGESTED BY THE NORTH-SEA INCIDENT—NO THEATRICAL DISPLAY IN THE BRITISH NAVY—ONE TOUCH OF DRAMA—OUR UNSATISFACTORY PROVISION FOR THE WOUNDED—OBJECT-LESSONS FROM THE FAR EAST

BY

FRED. T. JANE

AUTHOR OF "ALL THE WORLD'S FIGHTING SHIPS," ETC.

THE ideal Navy, of course, should not prepare for war at all, because it is always ready for it. In practice, however, this is impossible; because, for one thing, a big navy like ours cannot have all its ships in commission at once; for another, war means concentration. In peace time geography, peace duties and other necessities prevent fleets from being all together always. Consequently they are scattered about on their stations, and those who know how to watch the political barometer, can always gauge it by the positions of our principal fleets. Thus, when some of the Mediterranean ships are cruising in the Levant, others in Italian waters, and yet others up the Straits by Gibraltar, any observant man knows that the political barometer is at "set fair," while if these ships all come together it is not difficult to read the storm warning that such a gathering implies.

Every warship in commission carries, as a matter of course, her full quota of shot and shell, torpedo war-heads, ammunition, six months' provisions, and other requisites (except, perhaps, effective gun sights). This is the rule in our own and every other navy except the American. United States ships, for reasons of their own, never carry in peace time absolutely full magazines, the peace cargo being but two-thirds of the complete capacity; but this is not to be interpreted as negligence. It simply means that in addition to the ordinary supply, space is provided for putting in excess on board should circumstances indicate that it is unlikely to stay there long. America having the Atlantic between it and possible enemies is able to do this, and by this and similar economies is able to obtain those high qualities in armour and armament which make some critics imagine that United States warships are "paper" craft to a great extent.

We, of course, cannot indulge in such luxuries: consequently our ships are always cruising full of their war stores.

War, then, to commissioned ships is not a matter of any lengthy preparation, and gradually everything that would need any sort of preparing is being done away with. Thus, for instance, all our ships are now painted battle grey, so that if war comes suddenly, there is no delay in having to change from gaudy peace tints into the sombre hues of battle. To "war tint" a ship, sufficiently for war purposes, would have taken perhaps six hours,

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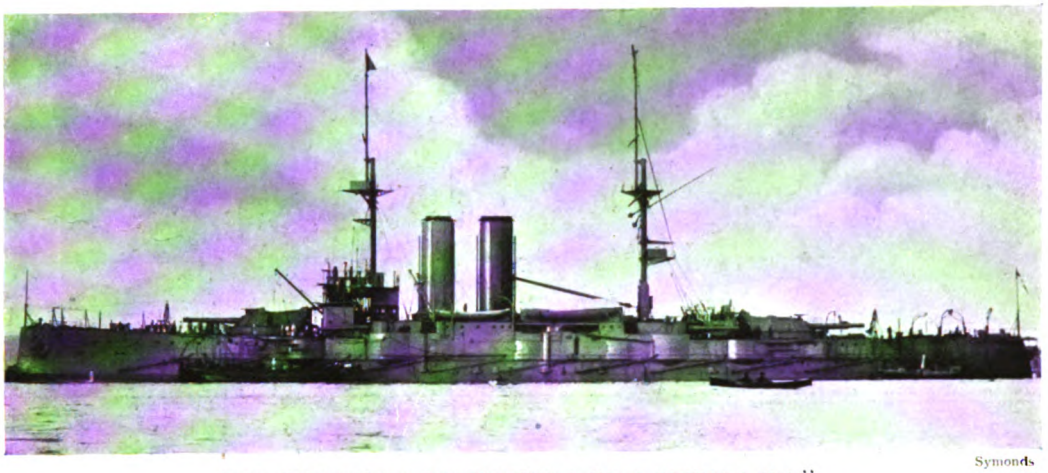

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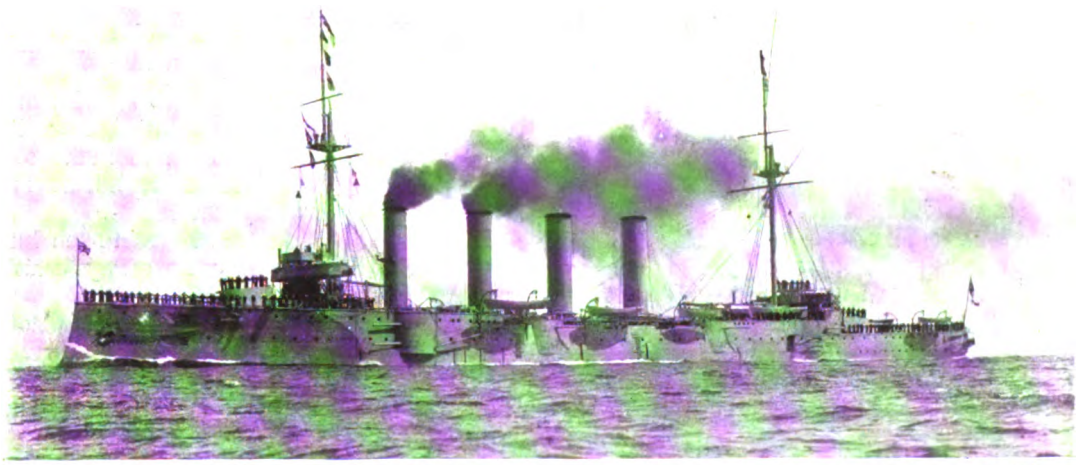
H.M. FIRST-CLASS BATTLESHIP "KING EDWARD VII."

The latest type of battleship. She is at present getting ready for her first commission. Her displacement exceeds 16,000 tons. Armament: four 12 in., four 9.2 in., ten 6 in. There is a 9-in. Krupp cemented belt, 12 in. on the big gun turrets, 7 in. on the battery. Steam is supplied by Babcock and Wilcox water-tube and a few cylindrical boilers associated with them; i.h.p., 18,000; speed, 18.5 knots

and this could have been done with the ships under weigh. But it would have meant many men being busy over the task who, free from it, can devote attention to more essential matters. That is how "paint ship grey" has ceased to be one of the items of a British "prepare for battle."

Incidentally it may be remarked that perpetual war paint is not universally accepted as a sound idea. The Russian Admiral Wiren, for instance, is no believer in it, his theory being that the sudden change of colour would make it difficult for the enemy to recognise individual ships—of course an advantage.

In clearing for action a warship is considerably transformed. Down comes the fore top mast; but the main top mast does not usually share a similar fate, because it is needed for the mast-head semaphore, the wireless installation, and is also useful for flag signals. In each fighting top, the upper top forward and the lower top aft, observation posts are installed



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H.M. FIRST-CLASS ARMOURED CRUISER "DRAKE"—THE FASTEST IN THE WORLD

The latest type of cruiser. She is of 14,100 tons and over 500 ft. long. She is protected on the water-line and on the guns by 6-in. Krupp armour. Armament: two 9.2 in., sixteen 6 in. Steam is supplied by forty-three Belleville boilers. Designed power, 30,000 h.p., to give 23 knots. On service, however, she considerably exceeds this speed, and has registered as much as 24.5 knots. Launched 1901

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"WAR IMMINENT"—THE CREW OF A DESTROYER GOING TO THEIR CRAFT

for the officers whose duty it is to take the range and estimate the accuracy of the shooting.* Telephonic communication with the conning towers is fixed up, and hoists are rigged for taking ammunition to the guns in the fighting tops.

* In the photograph of the *King Edward VII.* special positions for this will be noted on the masts. The *King Edward* is the first ship to be fitted with this interesting innovation.

Cribb

CLEAR FOR ACTION

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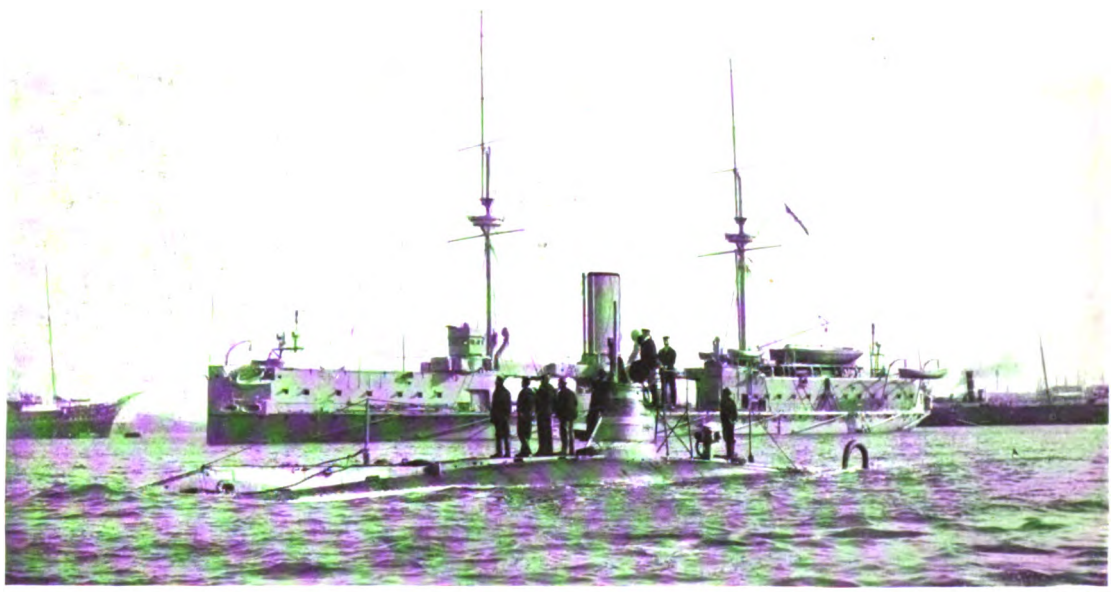
H.M. TORPEDO-BOAT DESTROYER "DERWENT"

The latest type of destroyer. It is of about 500 tons and 25-knot speed. She belongs to the latest "Exe" class of destroyer, slower but more seaworthy than the older type

Below, men are equally busy. The railings round the sides are removed, and so are the tops of all the hatchways. Down come the small ventilating cowls; the big ones mostly went a year or two ago with the peace paint. Should it be a ship in which any are still left they will come down and be sent ashore or thrown overboard according to circumstances. In place of such as are necessary, windsails of canvas will be rigged up to convey the fresh air below.

The securing bolts of the big guns have to be unloosed and the turrets swung to see that all is clear and in thorough working order, for though they might have been working beautifully a few hours before they will still be tested to make all sure. Not so very long ago a big gun turret in one of the Channel Fleet ships was put hopelessly out of action through the turn-table being jammed with some articles of a bluejacket's uniform that chanced to have slipped down in the way! It took a week to



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SUBMARINE A3 LEAVING DURING THE RECENT MOBILISATION

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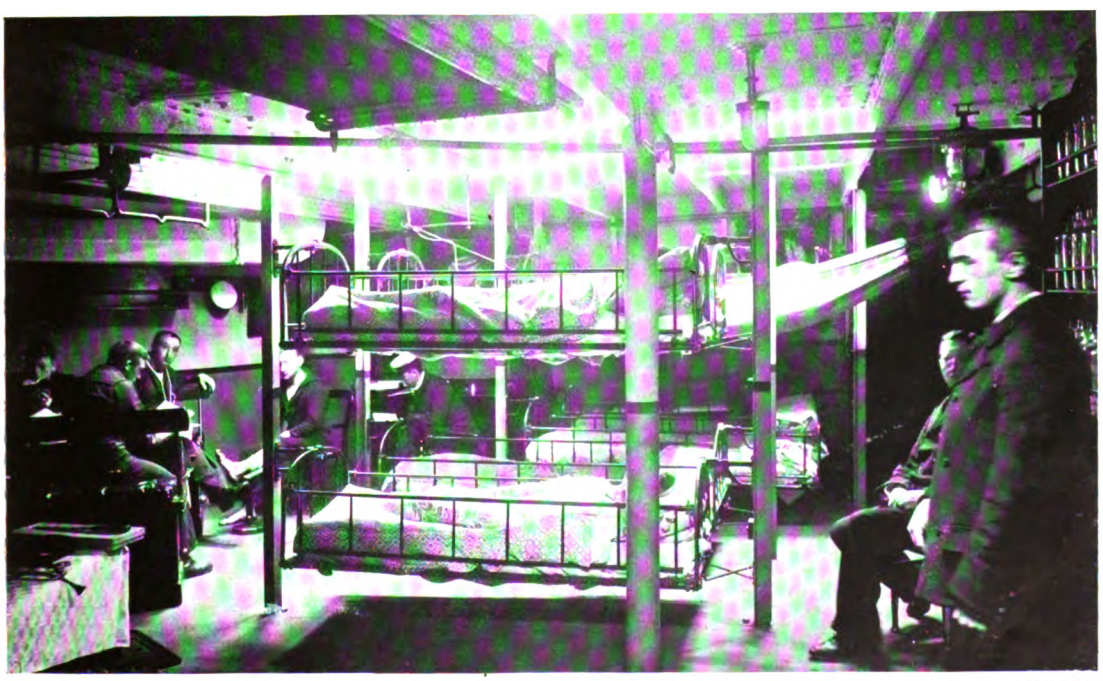
COMMISSIONING A MOBILISED DESTROYER DURING THE LATE CRISIS



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THE SICK BAY—READY FOR THE WOUNDED

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extricate these clothes. Hence the need of the most careful inspection of every single detail.

The broadside guns, which, in ordinary times, are housed inboard, have all to be slung out, and busy men will be at each slashing the polished metal-work over with paint, so that the gun shall not offer too conspicuous a mark. The ammunition passages and hoists will be opened, and ammunition brought up, and stacked round the guns ready for immediate use. Finally, each gun will be loaded with its full charge so that not even an instant's

near them, and that is why in the first days of the North Sea incident, naval men were so slow to condemn the Russians as incompetent, because of their terrible mistake. In war everything is a possible enemy. A fleet preparing for war knows it, hence every gun is kept loaded, and, furthermore, big lumps of coal, old iron bolts, and suchlike things are kept on deck ready, should the ship be in harbour, to heave into any boat that comes alongside without permission. There is that never-forgotten episode of naval history when

Crabb

THE EFFECT OF THE NORTH SEA INCIDENT AT THE GOVERNMENT DOCKYARDS

Preparing for war. Night-shift men at Portsmouth leaving off work in the morning

delay may be experienced, should the need to fire come suddenly. Once war is declared, attack may come unexpectedly at any moment, a bolt from the blue in any shape or form. At any moment there is the off-chance of the cupola of a submarine emerging near by, bent upon destruction, or the most harmless looking fishing-boat may be loaded with engines of death. Many and many have been the good folk ashore who have scouted as absolutely ridiculous the idea that the Russian Baltic Fleet could have seen danger in fishing-boats. Naval men know better. History is full of ships damaged or sunk by apparently peaceful craft getting

a Chilian ship hoisted on board a deserted boat full of vegetables which suddenly exploded and destroyed the finder with nearly all her crew. Whatever may be doing and wherever she may be, so long as the war lasts, anxious eyes will scrutinise the water from every ship, and never more carefully than at "war imminent."

Between decks in our warships other gangs of men will be busy, breaking down all wooden partitions, carrying the fragments to the stokehold for burning or throwing them overboard. Overboard, too, unless the shore be very handy indeed, will go the cabin furniture or most of

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it—for there is no room in war time for things that will burn. By the time these preparations are completed the after part of the ship will be a wreck. As likely as not, most of the officers' cabins will be knocked into one, and—if the ship prepares for war in a dockyard—bags of extra coal will fill the spaces thus made. The officers must sleep anywhere as best they can.

Over the decks sand will be strewn thickly, and then pumped on with a hose. Fire mains will be permanently rigged, and so will all pumps—at any unexpected moment they may be needed. Finally all over the ship buckets and basins full of oatmeal and milk, or of barley water, will be stood. They are for the thirsty and the wounded in the hour of battle.

Down below, in the bowels of the ship, in the stoker's bath-room most probably, the doctors and their assistants will have gathered with the gruesome tools of the doctor's trade. This is the modern cockpit—though only the first few wounded are likely to be brought to it; the rest, it is generally believed, will have to lie where they fall till the inferno of battle be spent. But above in the casemates and at other places first-aid appliances will be set out, ready for use should circumstances admit. Mostly, however, it is "God help the wounded." No one fears being killed, but many a brave man dreads being wounded—the care of the wounded being one of the most terrible problems of modern naval warfare. Our shortcomings in this respect are great, our advance over the Nelson days very little; anæsthetics are very limited, and doubts exist here and there as to whether some of the surgeons are "good at carving." The pay and prospects of naval surgeons are relatively poor, so poor at least that it is stated that the best men rarely go into the navy. To be sure the medical branch is better paid than any other in the navy, but the doctor if he goes to his wounded is pretty certain to be killed or wounded without any of the combatant's chances to hit back. Incidentally, too, though ships are over-doctored for peace, they do not carry enough medical men to deal with a heavy casualty list.

When battle is imminent this is a point that forces itself into prominence. All that can be done is done. Paymasters and the parson are turned into doctor helps, and on deck lifebelts are collected so that should the ship be about to sink the wounded can be put into them and thrown overboard on the chance of being picked up later.

Boats, of course, are mostly left behind. Two filled with water and roped about may hang at the davits, but the rest will be landed in the dockyard, or, at any rate, put overboard in charge of a steam launch before the battle. On board they would only get destroyed, and their splinters cause terrible wounds, as the Russians learned to their cost both at Chemulpo and on board the *Tsarevitch* in her last fight.

The final war preparation is of a dramatic nature, the only dramatic touch permitted, perhaps—for the British Navy is very averse to anything that savours of an appeal to the gallery. Not so long ago a well-known admiral went down fifty per cent. in the esteem of the crews under him, by issuing an address to them in some naval manœuvres. "Men of the —— fleet," it began, or is said to have begun, "your country is now at war and the eyes of the empire are upon you." It was "gallery," and it had the same fatal effect that the hoisting of Nelson's famous signal, "England expects every man to do his duty," would have had. Anything theatrical is considered inappropriate when business-like killing is toward; and the one hopeful augury for our future is that while the public grows daily more neurotic, more hysterical, the "great silent Navy" tends ever more and more to a cold utilitarianism whose watchword is "Deeds, not words."

And so it is that in preparing for battle there is little that is dramatic in the cheap sense of the word. The sole touch is that six big battle flags are hoisted—one at each mast-head, and two to support it in the rigging of each mast.

This, too, is purely utilitarian. It is one of the many *obiter dicta* attributed to that great practical seaman, Admiral Sir John Fisher, that a patriot of the hysterical type once said to him anent the battle flags, "Ah, I am glad indeed to see that you preserve the glorious old traditions of the flag!"

"Traditions be blowed," the Admiral is said to have replied; "it means that we don't have to waste men replacing an ensign shot away."

The story may or may not be true; but the sentiment expressed is the sentiment of the British Navy through and through. And so, as the British fleet goes into action, and the boom of the battle guns sounds at last in deadly earnest over the water, there will be no men saying, "Remember Nelson, and Trafalgar," to each other. Probably nothing will be said at all, but if anything does break the silence

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before the guns begin, it will most likely be the voice of some sporting bluejacket trying to get a chum to lay odds on his chances of survival!

Tot homines, tot sententiæ. American "Jackies" in the war with Spain found "Remember the Maine" a useful battle-cry, though a battle-cry is the last conceivable thing in the British Navy. A Frenchman will fight all the better for "*Courage, mes braves,*" with a sprinkling of *La gloire* thrown in, and the Germans in the Kaiser's opinion will steam more easily to victory fortified with some imperial-made maxim or verse suitable to the occasion. Russians—when going to certain death against hopeless odds, as at Chemulpo—seem to find a band sustaining, but mostly their reliance is placed upon the sacred *ikon* which stands in an upper corner of every gun casemate in their ships. The Japanese, according to report, yell *Banzai* at frequent intervals, but I do not myself believe that they do. Silence is more in their line than that; if they do say anything at all, it is probably to assure one another that theirs is the more powerful side, for in the East it is always the stronger that is the object of sympathy and admiration. Now and again I believe they have tended to be theatrical on going into action, but this is the result of imitating what is supposed to be the "correct thing." The real Japanese is he who goes into battle silent, fights like a hero, and then should the day be lost, commits suicide with much unnecessary torment. It is the navy in which surrender is least likely of any, though the Russians do not seem far behind. How we should fare in this respect there is no modern history to show, though the British Navy will now and again point out that in the "regrettable incidents" with white flags in South Africa, no naval men ever figured.

To return to my subject, from which I may seem to have wandered somewhat, commissioned ships have nothing to do in preparing for war beyond preparing for battle. It is otherwise, of course, with the ships in reserve, of whose mobilising we heard so much the other day. That mobilisation was more of a test of our preparedness than aught else; and much that appeared in the newspapers as being done was not done at all in reality. But we had the shadow of what might be, just as we had it at the time of Fashoda and at the time of the Flying Squadron.

The first men to be affected are the dockyards men; in a sense they are the only people much affected at all, for the navy is happily now so organised that it can actually mobilise without hitch or excitement.

The dockyards men are first affected because they have to put the finishing touches as quickly as possible to any work in hand. That means overtime, night shifts, and, if necessary, work on Sunday.

Every officer doing duty in harbour ships or anywhere else in the home ports has his "war appointment." On receiving the mere order to take this up he knows exactly where to go. Similarly the men are all told off—it is all arranged beforehand; the authorities have only to switch on, as it were, and the wheels go round.

In the store establishments all the stores for individual ships other than those always in place, lie neatly apart and ticketed. Thither go the crew, and in a very short time things are got aboard.

Much, of course, always is on board the reserve ships. There is coal in their bunkers, ammunition in their magazines, and best of all a "skeleton crew." There is a chief engineer who knows the tricks of the engines (and the engines of warships have often the most strange individualities). He, too, knows the state of the boilers, which ones had better be dealt gently with, which repairs ordered to be done have been shelved for other work, and he has his private list of dockyard repairs not done as he would have had them done. Some of these perhaps he will put his people to see to at once if time admits—it is often the privilege of engine-room complements to have to do over again work supposed to have been done for them in the yard.* Probably the ship has Belleville boilers, and the engineers will get ready all the spare tubes they can, for any day may bring a shot in the boilers. If the hit is not too serious, damaged tubes can be taken out and fresh ones screwed in, this ability to repair being the "military" quality of the Bellevilles of which we hear so much now and again. It is only found in boilers of French invention, and has been the cause of bother before now in peace time when badly screwed-in tubes have leaked, but when war is in the air it is an inestimable advantage, for no ships that can possibly be kept with the fleet can be spared for dockyard repairs after a battle.

The engineer is the most important person with a mobilised ship. Almost everything depends upon him and the machinery for which

* The *Diadem* is a case in point. After a dockyard repair all her boiler tubes leaked, and her artificers spent six weeks in going over them all again.

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he is responsible. Of all this the man on shore knows nothing; to him it is only "light fires and steam away." To the toiling men below it lacks that sweet simplicity; there are a million things to arrange in a few hours, and for a week at least till the long idle engines have got into tune there will be very little rest for any one below, and if in that period the chief engineer gets his clothes off or more than four hours sleep out of the twenty-four, he will count himself a lucky man. In a past steam trial in days of peace he will have learned something; in the commissioning trial that will be run, if circumstances admit, he will learn more, but it will be many days' steaming before things have shaken down. I have emphasised this matter of the engineers because by the good folk ashore they are the very last people thought of when they picture a ship going out to war. They are the modern substitute for that favouring wind for which Nelson used to pray, though, fortunately for the country, infinitely more reliable.

While our ship is getting up steam the people above will have been busy clearing for action as they clear in commissioned ships. The men, who, each with hammock and bag, stuffed with his worldly goods, crawled on board like a disturbed coterie of ants carrying eggs, will now be running to and fro with sacks of coal from lighters alongside or from trucks upon the jetty. In every possible corner these coal bags will be stowed, reinforcing turrets, filling cabins, everywhere; for in war every ounce of coal is worth its weight in gold, and the fleet that can steam longest is the fleet most likely to win. Woe betide the stoker who shovels coal anyhow under his Bellevilles in defiance of the ethics of that canny Frenchman * who said, "Coal it is that will win the naval battles of the steam age."

The next (to the landsman) most unexpected worry is teaching the new crew their way about the ship. A modern warship is such a vast conglomeration of doors and passages that it is no exaggeration to call it three months' work to learn them all. The problem when war is toward is an acute one. For the first few days the best will in the world will not enable the men to get quickly to their stations, and the efficiency of the ship will be correspondingly hampered. The men too, have got to get to know and rely upon one another. It is an old and true saying that one commissioned ship is probably worth two mobilised ones; and there are those who assert that for the first six months of a war the only efficient ships will be those which were in regular commission when the trouble began. Hence the mischief wrought by those who advocate a small peace navy with large reserves. For such a fleet victory is well-nigh impossible, and it cannot be too clearly laid down that to win a navy must be on a war footing and ready in the piping times of peace.

The naval authorities are, of course, alive to this; all the efforts of great organisers like Sir John Fisher are devoted to securing the most powerful squadrons in daily service. Indeed, it is extremely doubtful now whether any large mobilised ships would go to swell existing fleets save in cases of dire necessity. Instead they would be formed into practice squadrons, drilling together till the units were needed to fill gaps.

With the small craft it is somewhat different, and numbers of destroyers lie up till the war bugles are sounding. Small craft in daily use wear out so quickly that a war reserve of them is essential, and the first step in mobilising is to commission the spare destroyers. They take precedence of the big ships in importance. The other day, it was the destroyers that were commissioned, and hurriedly sent away to the rendezvous.

Thus does a Navy prepare for war. First and last and all the time it does what has been arranged for it in peace; nothing of value can be extemporised at the psychological moment. Its plans and schemes are drawn up beforehand, and depend of course upon who is the enemy. Details of this sort are better not entered into; but the main feature of any way is fixed: the enemy must be shadowed. At the first warning, out go the cruisers to hang on the flanks of the enemy, and inform the battle fleet where that enemy is, and whither he goes. Everywhere that he is there must we be also in superior force—he must be helpless at the beginning. War will see the thunder of guns, the "decks slippery with blood," and that "deadly hail of shot and shell" so dear to the descriptive writers. But not there will the real victory be won: victory will have been attained back in the days of peace by those who saw to it that all was ready.

* Julien Belleville, the original inventor of the water-tube system some fifty years ago. Though subsequently lost sight of and only achieved within the last two or three years, the original idea was to obtain with a small quantity of coal what was secured by a big one in other methods. Most of our early Belleville troubles were due to too much coal being put on the fires by too energetic stokers.

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Of this we have had an object-lesson in the Far East. On paper, the rival fleets of Russia and Japan were fairly enough matched; but in actual fact it was a case of the entire navy of Japan prepared and ready against the Russian cruiser *Bayan* (the solitary ship that was ready) and a mob of vessels, full of powerful guns and brave men, but unprepared for war. When war came they threw overboard their woodwork, cast loose their guns, and opened their magazines, but the preparedness for war in peace was not theirs. It was not the torpedo attack which lost the day for Russia: indeed, that was Japan's great error. She had better have waited and put her all upon a great sea fight, then at one blow all would have been hers.

The real preparing for war is all done in the years of peace. And the qualities for this are, leaders who know their own minds, and men trained to trust each other and those leaders, able to use and know their weapons, and beyond all else able to act together.

ADMIRAL SIR JOHN ARBUTHNOT FISHER:

THE NEW FIRST SEA LORD AND HIS POLICY

THE appointment of Sir John Arbuthnot Fisher as First Sea Lord is one of the chief events of the year 1904. The First Sea Lord of the Admiralty is the man upon whom rests the responsibility of ordering the Fleets of Great Britain. It is upon his brains and character, tenacity of will and endurance, that the country depends in time of war. Only when we consider that India, South Africa, and Ireland are held by sea power, and that the King would cease to be Emperor of India or King of Ireland if the trident slipped from the hands of Britannia, can we understand the importance of the office of the First Sea Lords of the Admiralty. We are accustomed to think of the Lord Chancellor, the Viceroy of India, the Lord Lieutenant of Ireland and the Cabinet Ministers as personages of greater importance than any one of the Lords of the Admiralty. This misconception of the relative weight attached to their respective offices arises from the fact that since the close of the American War in 1814 Britain has been at peace with first-class maritime Powers.

Sir John Fisher has passed through the mill in gaining qualifications for the office he now holds. Born in 1841, he entered the Navy at the beginning of the Crimean War, in which he served as a midshipman. Attaining the rank of lieutenant in 1860 he took part in the capture of Canton and the Peiho Forts. He took part in the China War of 1859–1860 and in the Egyptian War of 1882. As captain of the *Inflexible* he was one of the few men living who have commanded a ship in action where loss of life was occasioned by the enemy's shell. It was owing to Sir John Fisher that Lord Charles Beresford obtained the chance of a lifetime by being landed at Alexandria when the city was abandoned to robbers, and by becoming responsible for order established his reputation. In 1886 Sir John Fisher was appointed Director of Naval Ordnance and for five years he was responsible for the guns of the Fleet. In 1891 he became the Admiral Superintendent at Portsmouth Dockyard, and next year as Controller of the Navy he became a Lord of the Admiralty for five years. In 1897 he went afloat as Commander-in-Chief on the North American and West Indies stations, where his beloved flagship, the *Renown*, was fitted to suit his requirements in such a manner as to call down the hostile criticism of the arm-chair naval experts. It was in connection with the *Renown* that Sir John Fisher's memorable answer was given to the question, When does a vessel leave off being an armoured cruiser and become a battleship? The reply was, "When does a kitten become a cat?" Another answer to the same question given when commanding the Mediterranean squadron was, What is the difference between a small horse and a large pony? Sir John Fisher loved the *Renown*. He took her with him to the Mediterranean and he speaks of her to this day with the affection of a hunting man for his favourite horse. He wrote of her:

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"Lapse of time has depreciated the value both of her armour and her armament. She has beaten many cruisers in speed in heavy weather (such, for instance, as the twenty-knot *Talbot* class). She steamed over 3000 miles from Bermuda to England at fifteen knots speed, and had 25 per cent. of her coal left. She had been then two years out of dock and had to steam against a heavy head swell, and one blade of the propeller was gone. (The sailors said she did her best when she was 'half screwed'!)"

Before his appointment to the command of the Mediterranean Squadron, Fisher was appointed by Lord Salisbury as delegate to the Peace Conference at The Hague. He made a profound impression upon his colleagues at that memorable assembly, more especially upon the German and Russian delegates. The German Emperor has been heard to say that in Sir John Fisher England possesses an admiral of commanding qualities fit for the heaviest responsibilities and for the execution of the most difficult tasks.

While in the Mediterranean Sir John Fisher carried on a campaign of argument and entreaty with the Lords of the Admiralty, the effect of which was to convert the Mediterranean Squadron from an assembly of ships more or less prepared for war into a homogeneous fleet where the captains were a band of brothers, and every nut, bolt, and screw of guns and hulls alike attained the highest state of efficiency. Under Fisher the Belleville boiler behaved with exemplary virtue. The speed of the Fleet was increased by two knots. The health and discipline of officers and men attained a higher standard than at any previous period in the history of the command.

On leaving the Mediterranean he was appointed as Second Naval Lord of the Admiralty in 1902. The Second Naval Lord is responsible for the education and training of the Fleet. Sir John Fisher took a wide view of his responsibilities and effected revolutionary changes in the intellectual training of naval officers. He also tackled the difficult question of the engineers, which, neglected by successive Boards of Admiralty, had attained the proportions of a scandal, fatal to efficiency in time of peace and dangerous to national existence in time of war. The engineers claimed social equality and executive power. The executive officers, drawn from a different social stratum, resented the aspirations of the mechanical experts. Until Sir John Fisher tackled the question nothing was done. His plan was to go to the root of the matter and, by putting them all into one basket and shaking them up, the social difference between the executives and the engineers was abolished by a stroke of the pen. The difficulty that existed until last year is illustrated by the following anecdote. The first lieutenant of a crack ship in the Mediterranean had an altercation with the chief engineer of the same vessel who had worsted the lieutenant in an argument as to which of the two was the more important officer in time of war. Confounded by the arguments of his adversary the lieutenant fired a parting shot into the hull of his antagonist. "What you say may be all very true, and you may be the better man on board ship, but on shore all I know is that my mother would not ask your mother to tea." By passing all the cadets through the new Osborne College and giving them common traditions and equal pride in the various branches of the service the social chasm has been abolished, and henceforward the question which has simmered and rankled for forty years has been laid to rest by the genius of a man one of whose qualities is superb common sense.

In January 1903 the designs of the Osborne College did not even exist. On August 4 of the same year, the King declared the College open. The scheme was Napoleonic in its audacity and Cromwellian in its thoroughness. The cadets at Osborne received their instruction in a college which was built in one-twelfth of the time and at one-tenth of the cost of the College at Dartmouth, the only difference being that bureaucrats were responsible for the one, a born administrator for the other.

When Sir John Fisher left his appointment as Second Sea Lord of the Admiralty he became Commander-in-Chief at Portsmouth, where he continued his lifelong practice of beginning work at 4 or 5 A.M. By this means, according to his own statement to a critic, he had the day for idleness. Sir John Fisher's "idleness" is indistinguishable from the strenuous life of other people. Among the recreations he allowed himself was the acceptance of a position on the memorable Committee of Three appointed by the Government to submit a plan for the reorganisation of the War Office. The great brain, cool judgment, and unerring common sense of the Admiral were instrumental in the production of a report which, if accepted in its entirety, would have saved the country from £14,000,000 to £20,000,000 sterling in the cost of imperial defence, and given to the nation a stronger Army and a more powerful

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Navy. The social influence of the Army at Court, in the House of Commons, and in society has prevented the full adoption of the Fisher scheme of re-organisation. It was mutilated, and in consequence, the nation has still to show it has learnt the lessons taught by the late Boer War.

When Sir John Fisher became First Sea Lord of the Admiralty the extraordinary magnetism of his personality and the vitality and vigour of the man profoundly impressed the nation with the belief that, in his hands, Britain is safe. There is, however, one link missing in the chain of communication between the First Sea Lord and the nation. There is no representative of the Navy in the House of Commons, and the First Lord of the Admiralty, the Earl of Selborne, in the House of Lords is an ex-colonel of yeomanry. Having regard to the supreme importance of the Fleet to Britain and the Colonies it is necessary that Sir John Fisher should be able, in case of necessity, to speak direct to his fellow countrymen on the subject of the Fleet. Fifty-seven military men are in the House of Commons.

From what has already occurred since Sir John Fisher left the Mediterranean command, it is easy to perceive the main lines of the policy of the new First Sea Lord. The elimination of unwarworthy vessels, the concentration of our naval strength, and the more effective use and distribution of the *personnel* are the keynotes of the new *régime.*

(1) A long peace has diminished the fighting efficiency of British Fleets by bringing trifles into prominence and hiding the conditions of actual war. Sir John Fisher holds that a Fleet to be of any use must be ready to strike at an hour's notice. Quick action at the outbreak of naval war is worth many lives and many millions of pounds to the nation. The consequence of adopting the principle that war fleets should be on a war footing is the elimination of all useless non-fighting ships, and the adoption of all the conditions required in war time. The importance of gunnery will be developed as it has never been before, and lieutenants and commanders will no longer depend for their promotion upon paint or gold leaf they buy out of their private pockets or " lift " from the dockyard. Naval officers will welcome this change. Efficiency in war will be the avenue to promotion as regards the *personnel*, while the *matériel* will be chosen with a single view to its effect on the enemy, whether it be a pot of paint or a big gun. This principle of War Fleets on a War Footing involves radical change in our naval service and logically leads to the second point—Concentration.

(2) The disposition of our eleven naval squadrons is a legacy from the great French wars. The eleven squadrons of Britain were allotted for the most part to their present stations when sail, not steam, was the motive-power. Hence arose the plan of three years' commissions in distant parts of the ocean. The necessity for these squadrons has passed away, and it is expected that, without special blowing of trumpets, the useless squadrons will gradually melt away. Already the Pacific Squadron is the ghost of its former self, and if it shortly disappears as a separate command, no one will regret it except the ladies of the Consular families up and down the coast of South America, and the early Victorian admirals who lament change even when it means fighting efficiency. The British flag can be shown in Pacific Ports as easily by a gunboat as by a squadron. Display of force where force is not required is both expensive and childish. Force should be found only where force is wanted. The abolition of the useless squadrons may not improbably be followed by the creation of cruising squadrons which will visit every part on no fixed plan, and which will appear where least expected. The reduction of a ship's commission to foreign service from three to two years will be a boon to officers and men alike. Three years' commissions are anachronisms in the twentieth century when the speed of ships increases every year.

(3) In regard to the more effective distribution of the *personnel* it must be obvious to every landsman that work on a warship is of two kinds, work that requires long and costly training to perform, and work that can be done by any disciplined man after a fortnight's instruction. It would not be a matter for surprise if this fact were officially recognised, much to the benefit of naval efficiency and the taxpayer's pocket. At present every member of a ship's crew in commission is the product of costly and prolonged education, while ships mobilised in an emergency take weeks and even months to " tune up " to the necessary standard of efficiency. It is easy to see that a vast field for reforming energy is open here to a strong Administration with a capable Minister and loyal colleagues at his back, and a nation sincerely resolved to waste no more money in paying twice over for the same job of preventing the invasion of these shores.

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EUGENICS: THE NEW SCIENTIFIC PATRIOTISM

THE MARRIAGE OF UNSUITABLE PERSONS—MR. FRANCIS GALTON'S PROPOSALS—THE PRACTICABLE DREAM OF A GREAT BIOLOGIST

BY

C. W. SALEEBY, M.D.

(MEMBER OF THE COUNCIL OF THE SOCIOLOGICAL SOCIETY)

LIKE his immortal first cousin, Charles Darwin, Mr. Francis Galton "does not advertise." The public therefore knows this octogenarian leader of science only as the student of finger-prints. It is not aware of the great advances in biology which we owe to Mr. Galton's application of mathematics to that science, founding the new study called biometry; it is hardly aware of his great work on the inheritance of genius; nor is it acquainted with "Galton's law" in heredity.

Lately, however, Mr. Galton *did* advertise, in a sense. That is to say, the University of London is seeking applicants for the post of Francis Galton Research Scholar in National Eugenics. Mr. Galton has given £1500 for this purpose by way of a beginning. Now what is all this about?

Many years ago Mr. Galton invented the word stirpiculture, which many of us have heard, but latterly he has substituted for it the word eugenics—*good reproduction*. His argument is that (1) heredity is a fact; (2) some people are fitter than others to be the parents of posterity; (3) education can only repress or develop hereditary potentialities; (4) it is well to begin at the beginning.

As every one knows, Mr. Galton's illustrious kinsman propounded the theory which usually goes by Herbert Spencer's phrase, the *survival of the fittest*, to account for the evolution of higher from lower living things. We recognise that on the whole, "natural selection"—to use Darwin's own term—is a beneficent process. The fittest are the happiest; the unfit mercifully die out, leaving no progeny, or but few. Thus—other factors doubtless aiding—has been so far accomplished what Tennyson called *the making of man*.

This process, I have no doubt, is still tending slowly to elevate the average of our race—but how slowly! Now Mr. Galton steps in with some such argument as this: Here is a great beneficent principle which has been at work, by land and sea, in the animal and the vegetable world, for tens or hundreds of millions of years. It is indisputably one of the laws of that "Power, not ourselves, which makes for righteousness." By its agency there has been developed, in its latest product—man—an intelligence to which its working has been revealed. Is it not, then, the duty of the human intelligence, having discovered this law, to utilise, aid and abet it?

Eugenics, then, is the science which deals with the conditions by which the human race may be physically, mentally and morally improved. But the reader need not fancy that Mr. Galton's eighty years in any way interfere with his active prosecution and development of his own idea. He has lately sent to every member of the Royal Society a request for precise and specified information as to mental achievement on the part of relatives; and the result is to prove that talented families do indisputably exist whose brains are a precious asset to humanity, and whose stock is beyond price. Mr. Galton himself, of course, is a case in point. He is first cousin to Charles Darwin, whose grandfather was the famous Erasmus Darwin, poet and physician, one of the forerunners of the doctrine of organic evolution. In Charles Darwin's veins flowed some of the blood of Josiah Wedgwood. Three of Darwin's sons are now Fellows of the Royal Society, and one of them is the President-Elect of the British Association. It is plain that any circumstances interfering with the marriage of Erasmus Darwin's father would have robbed the world of much which the bankers cannot estimate.

Generally speaking, then, the facts of heredity are facts, despite the hopelessly inaccurate popular conception of them—a conception

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derived in the main from the novels of Zola. It is true that, according to the Galtonian law of "repression towards mediocrity," the children of the genius, whilst above the average, tend to descend to it, whilst the children of the criminal, though morally inferior, are yet not quite as black sheep as their parent. But still it is well worth society's while that the genius and the saint, the athlete and the artist, should provide posterity, rather than the idiot, the criminal, the weakling, and the Philistine.

If now the reader asks how this consummation so devoutly to be wished may be reached without any loss or injury to those institutions which society has evolved through much effort, and which are not carelessly to be let go, Mr. Galton will answer him. First, I am sure—and I may note that this article is written entirely on my own responsibility- Mr. Galton would observe that, having only lately discerned a goal, he can hardly be expected already to have paved a smooth highway thereto. If there were nothing more to learn, Mr. Galton would not be spending his money in the high and generous fashion lately noticed. But this is not to say that he has no ideas on the subject. Already, unless I am much mistaken, he has the cardinal idea, and it is this.

Sneer at it as you or I may, in the last analysis it is public opinion that determines the doings of human society. A serious magazine is entitled to call itself an engine of progress precisely because of its influence on the factor which determines all progress. What, then, if Eugenics, as Mr. Galton suggests, were incorporated—as who can doubt it will be—in our national *religion?* Suppose that people come to recognise the appalling amount of misery induced by the marriages of people whom society is perfectly willing to let live, but who in return owe it to society not to burden it with any more of their kind. Social approval and disapproval are already most potent, even in connection with the tender passion, which is supposed to admit of no criticism or external dictation. Every one knows that social disapproval prevents all but a very few marriages between people of very unequal social status. Still more obvious is it that, under certain conditions of close relationship, marriage is never even contemplated by young persons who might otherwise easily fall in love with one another. Already the marriages of first cousins are often interfered with, in deference to a belief the evidence for which is very far from convincing. Beyond question the present century will not be out before public opinion and the unwritten laws of society will effectively interfere with the marriages of unsuitable persons. No legal enactment is necessary. The risk of social ostracism will be a powerful deterrent. You ask why such and such an one should be deprived of the privileges of life. But public opinion, obviously, will be cruel to be kind. In time to come, the number of people unfit to play their part in the great task of continuing man's mysterious pilgrimage on this dying planet will be practically negligible. If for two generations there were none but eugenic marriages, the failures of the third generation would be practically nil.

So much for one side of the question—the discouragement of the unworthy. Equally important is the encouragement of the worthy. We must have a national roll of distinguished families, says Mr. Galton. Men must learn to be as proud of being inscribed and of having their children inscribed on that roll as of having had an ancestor, probably worthless, who came over with the Conqueror.

In truth a new ideal of patriotism will arise from the practicable dream of this great biologist of the nineteenth century, who has been spared to preach a new gospel to the youth of the twentieth. It will come to be seen that one can do better things than *die* for one's country—and that one does not need to wear a uniform or cross the seas in order to serve her. The real patriots will number those—not that many sonnets will be written to them—who renounce the satisfaction of even such noble desires as that of parenthood, because they regard themselves as unlikely to father worthy children. Thus, though they will not die in their own persons, they will die in their race. Similarly, family pride will take a new aspect. The man or woman whose name is enrolled as member of a family already distinguished for intellectual achievement will seek, for the sake of the family honour, a partner whose mental equipment is higher than the average; and so the Eugenic cause will be served. The man who knows himself to be intellectually superior will, if he be a patriot, make many sacrifices in order that he leave as many children like himself as possible.

Mr. Galton's proposals may seem timid in comparison with some others; but they do not always shout the loudest who see furthest.

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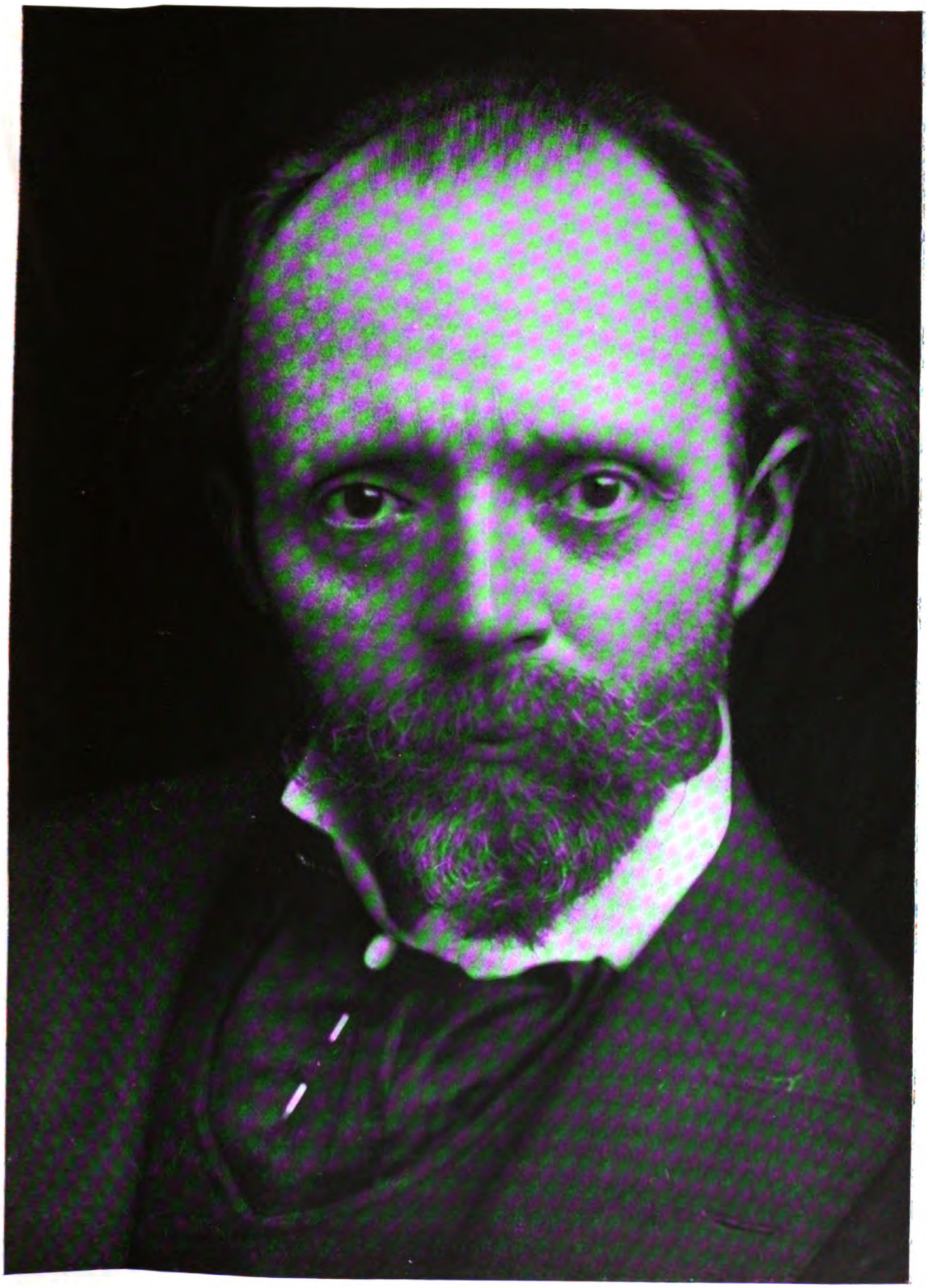

Beresford

MR. HALL CAINE

THE FAMOUS NOVELIST, WHOSE LATEST BOOK IS REVIEWED IN OUR LITERARY PAGES

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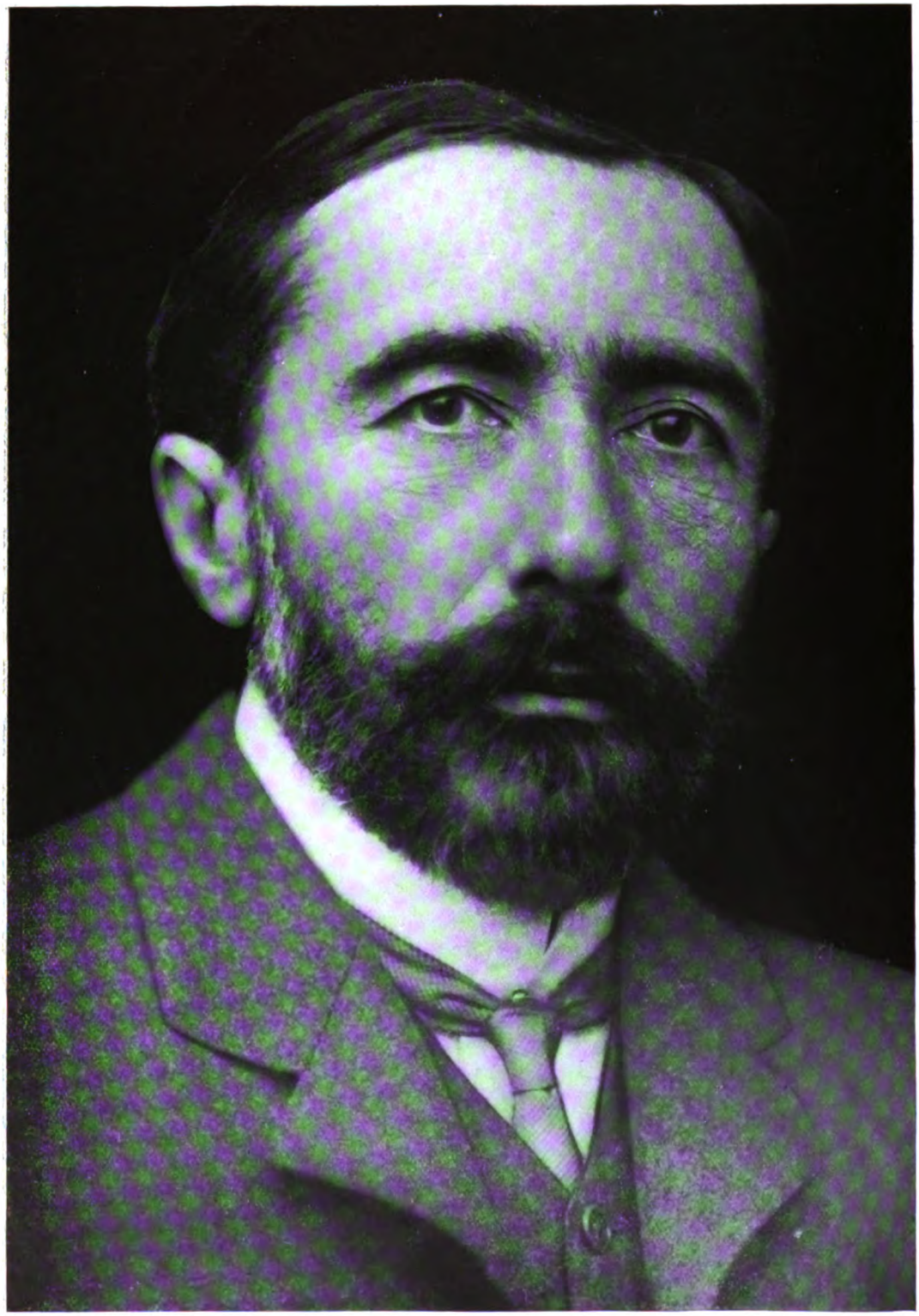

Beresford

MR. JOSEPH CONRAD

THE DISTINGUISHED ENGLISH NOVELIST, WHO IN HIS TIME HAS COMMANDED BOTH SAILING AND STEAM SHIPS, HAVING HAD NEARLY A QUARTER OF A CENTURY OF SEA SERVICE IN ALL SORTS OF CRAFT BEFORE HE TOOK TO AUTHORSHIP. MR. CONRAD IS A NATIVE OF POLAND

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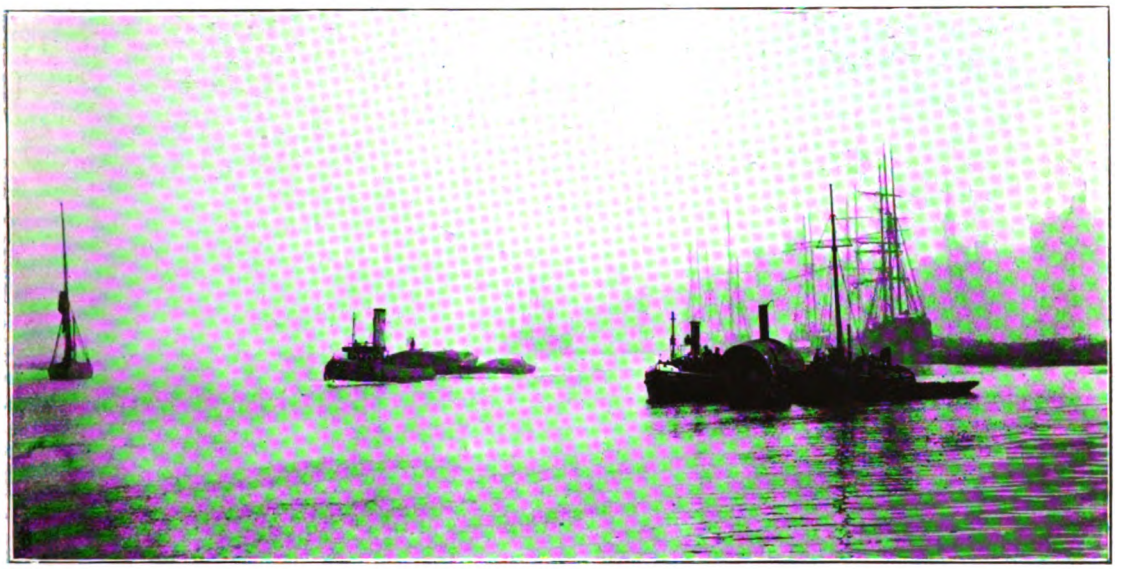
NEAR LONDON BRIDGE IN HAZY NOVEMBER



LONDON RIVER:

THE GREAT ARTERY OF ENGLAND

HOW THE WORLD'S COMMERCE COMES TO THE GREAT FREE PORT—
THE STORY AND THE SIGNIFICANCE OF THE THAMES

BY

JOSEPH CONRAD

AUTHOR OF "LORD JIM," "THE NIGGER OF THE 'NARCISSUS," &C.

Illustrated from photographs specially taken for THE WORLD'S WORK

THE estuaries of rivers appeal strongly to an adventurous imagination. This appeal is not always a charm, for there are estuaries of a particularly dispiriting ugliness: lowlands, mud-flats, or perhaps barren sand-hills without beauty of form or amenity of aspect, covered with a shabby and scanty vegetation conveying the impression of poverty and uselessness. Sometimes such an ugliness is merely a repulsive mask. A river whose estuary resembles a breach in a sand rampart may flow through a most fertile country. But all the estuaries of great rivers have their fascination, the attractiveness of an open portal. Water is friendly to man. The ocean, a part of nature furthest removed in the unchangeableness and majesty of its might from the spirit of mankind, has ever been a friend to the enterprising nations of the earth. And of all the elements this is the one to which men have always been prone to trust themselves as if its immensity had held a reward as vast as itself.

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SUNSHINE AND MIST

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From the offing the open estuary promises every possible fruition of adventurous hopes. That way open to enterprise and courage invites the explorer of coasts to new efforts towards the fulfilment of great expectations. The commander of the first Roman galley must have looked with an intense absorption upon the estuary of the Thames as he turned the beaked prow of his galley to the westward under the brow of the North Foreland. The estuary of the Thames is not beautiful, it has no noble features, no romantic grandeur of aspect, no smiling geniality; but it is wide open, spacious, inviting, hospitable at the first glance, with a strange air of mysteriousness which lingers about it to this very day.

ENTRANCE TO TILBURY
"THE MOST RECENT OF ALL LONDON DOCKS, THE NEAREST TO THE SEA"

The navigation of his craft must have engrossed all the Roman's attention in the calm of a summer's day (he would choose his weather) when the single row of long sweeps (the galley would be a light one—not a trireme) could fall in easy cadence upon the sheet of water like plate-glass reflecting faithfully the classic form of his vessel and the contour of the lonely shores close upon his left hand. I assume he followed the land and passed through what is at present known as Margate Roads, groping his careful way along the hidden sandbanks whose every tail and spit has its beacon or buoy nowadays. He must have been anxious, though no doubt he had collected upon the shores of the Gauls a store of information from the talk of traders, adventurers, fishermen, slave dealers, pirates, all sorts of unofficial men connected with the sea in a more or less reputable way.

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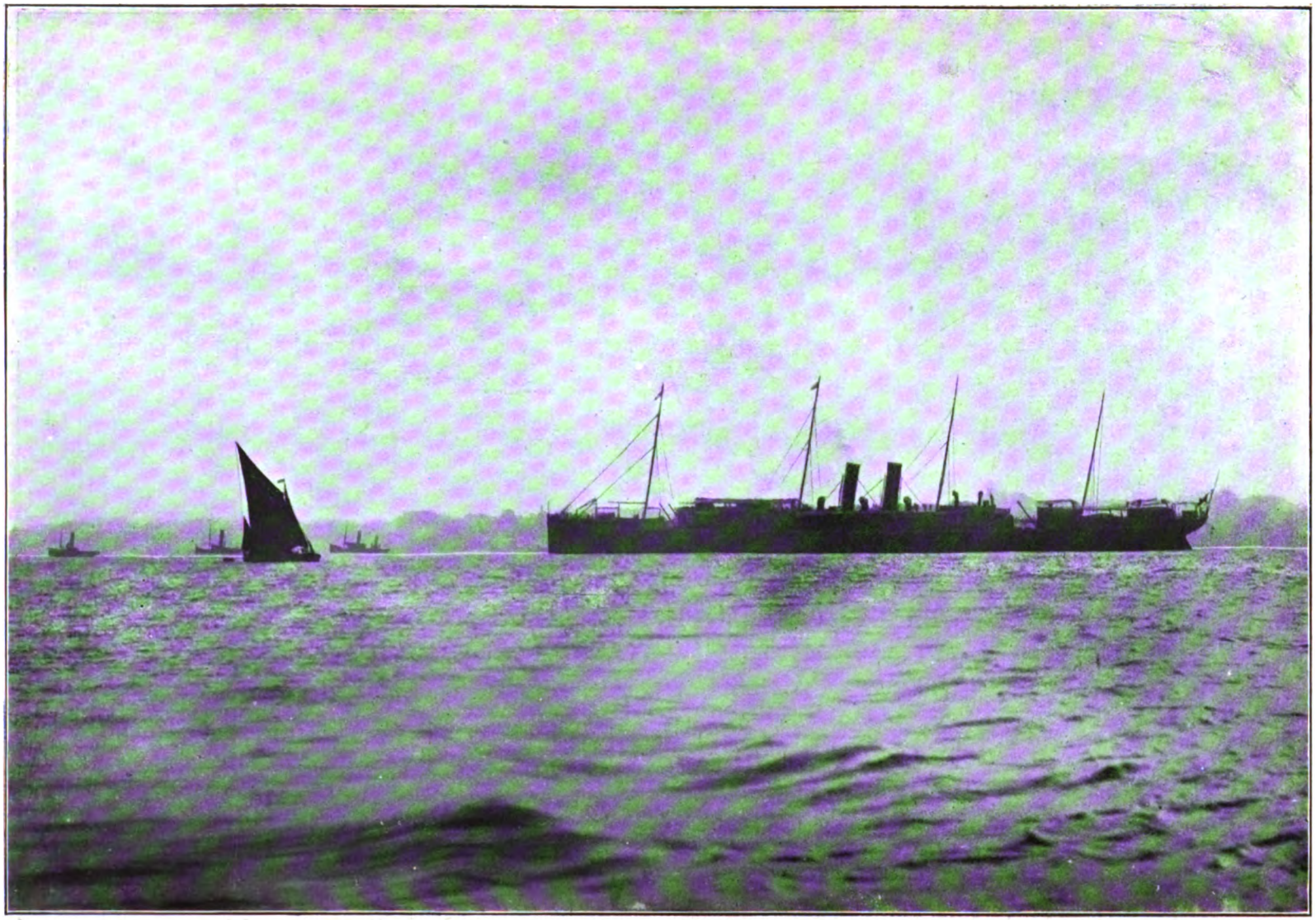

OUTWARD BOUND

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He must have heard of channels and sandbanks, of natural features of the land useful for sea marks, of villages and tribes and modes of barter, and precautions to take; with the instructive tales of native chiefs dyed more or less blue, whose character for greediness, ferocity, or amiability must have been expounded to him with that capacity for vivid language which seems to go naturally with the shadiness of moral character and recklessness of disposition. With that sort of spiced food provided for his anxious thought, watchful for strange men, strange beasts, strange turns of the tide, he would make the best of his way, a military seaman with a short sword on thigh and a bronze helmet on his head, the pioneer post-captain of an imperial fleet. Was the tribe inhabiting the Isle of Thanet of a ferocious disposition I wonder, and apt to fall with stone-studded clubs and wooden lances hardened in the fire upon the backs of unwary mariners?

Amongst the great commercial streams of these islands the Thames is the only one I think open to romantic feeling, from the fact that the sight of human labour and the sounds of human industry do not come down its shores to the very sea, destroying the suggestion of mysterious vastness caused by the configuration of the shore. The broad inlet of the shallow North Sea passes gradually into the contracted shape of the river; but for a long time the feeling of the open water remains with the ship steering to the westward through one of the lighted and buoyed passage-ways of the Thames such as Queen's Channel, Prince's Channel, Four-Fathom Channel; or else coming down the Swin from the North. The rush of the yellow flood-tide hurries her up as if into the unknown between the two fading lines of the coast. There are no features to this land, no conspicuous far-famed landmarks for the eye; there is nothing so far down to tell you of the greatest agglomeration of mankind on earth dwelling no more than twenty miles away, where the sun sets in a blaze of colour flaming on a gold background, and the dark low shores trend towards each other. And in the great silence the deep faint booming of the big guns being tested at Shoeburyness hangs about the Nore, a historical spot in the keeping of one of England's appointed guardians.

The Nore sand remains covered at low water, and never seen by human eye; but the Nore is a name to conjure visions of historical events, of battles, of fleets, of mutinies, of watch and ward kept upon the great throbbing heart of the State. This ideal point upon the waters of the estuary, this centre of memories, is marked upon the steely grey expanse of the waters by a lightship painted red that from a couple of miles off looks like a cheap and bizarre little toy. I remember how, on coming up the river for the first time, I was surprised at the smallness of that vivid object; a tiny warm speck of crimson lost in an immensity of grey tones. I was startled, as if of necessity the principal beacon in the waterway of the greatest town on earth should have presented imposing proportions. And—behold!—the brown sprit-sail of a barge hid it entirely from my eyes.

Coming in from the eastward the vivid colouring of the lightship marking

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"WIDE, OPEN, SPACIOUS, INVITING"

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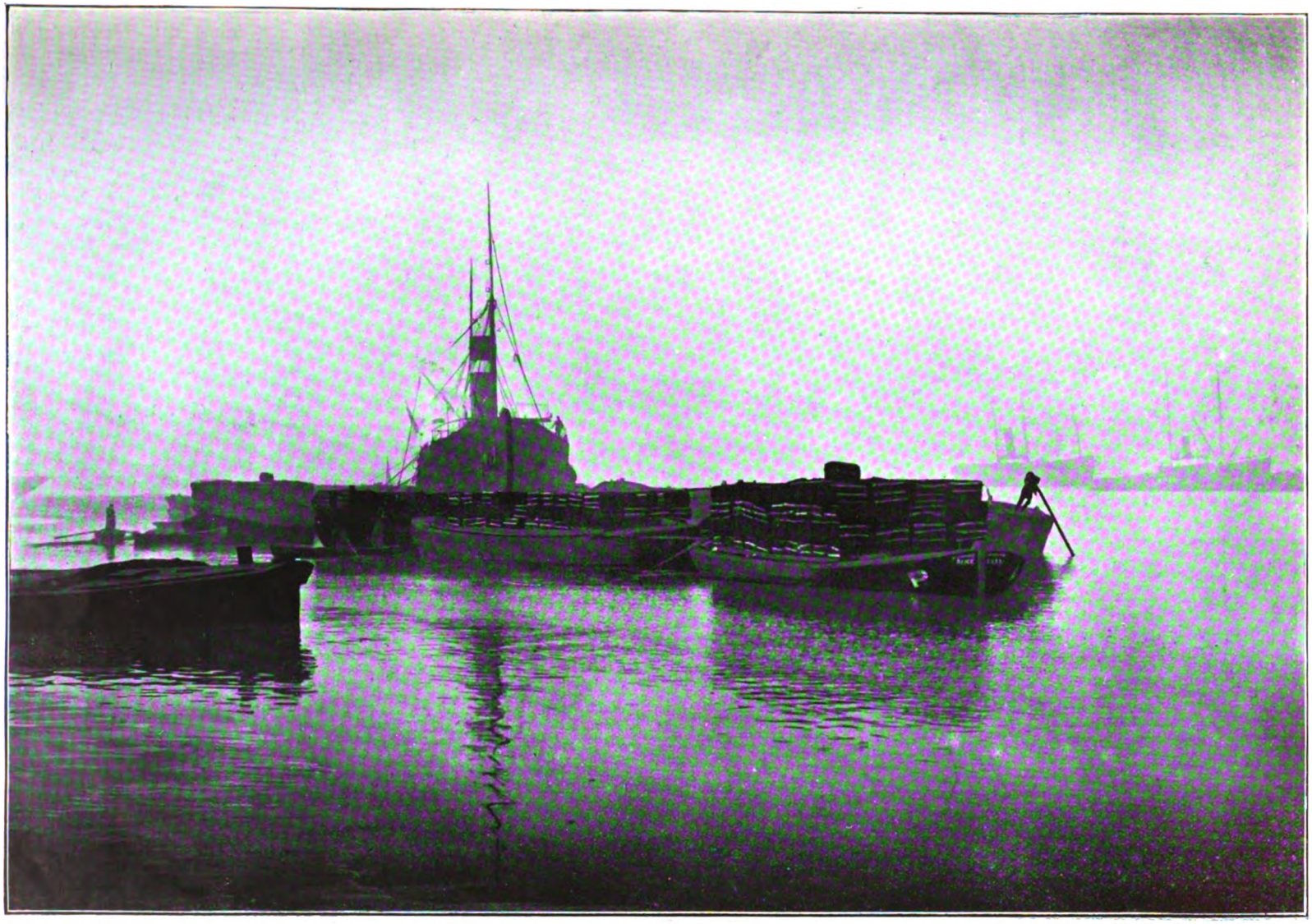

IN THE UPPER POOL OF THE THAMES

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the part of the river committed to the charge of an Admiral (the Commander-in-Chief at the Nore) accentuates the dreariness, and the great breadth of the Thames estuary. But soon the course of the ship opens the entrance of the Medway with its men-of-war moored in line, and the long wooden jetty of Port Victoria with its few low buildings like the beginning of a hasty settlement upon a wild and unexplored shore. The famous Thames barges sit in brown clusters upon the water with an effect of birds floating upon a pond. On the imposing expanse of the great estuary the traffic of the port where so much of the world's work and the world's thinking is being done becomes insignificant, scattered, streaming away in thin lines of ships stringing themselves out into the eastern quarter through the various navigable channels of which the Nore lightship marks the divergence. The coasting traffic inclines to the north; the deep-water ships steer east with a southern inclination, on through the Downs, to the most remote ends of the world. In the great widening of the shores sinking low in the grey smoky distances, the greatness of the sea receives the mercantile fleet of good ships that London sends out upon the turn of every tide. They follow each other, going very close by the Essex shore like the beads of a rosary told by business-like shipowners for the greater profit of the world. They slip one by one into the sea, while in the offing the inward-bound ships come up singly and in bunches from under the sea horizon, closing the mouth of the river between Orfordness and North Foreland. They all converge upon the Nore, the warm speck of red upon the tones of drab and grey, with the distant shores running together towards the west, low and flat, like the sides of an enormous canal. The sea reach of the Thames is straight, and, once Sheerness is left behind, its banks seem very uninhabited, except for the cluster of houses which is Southend, or, here and there, a lonely wooden jetty where petroleum ships discharge their dangerous cargoes, and the oil storage tanks, low and round with slightly domed roofs, peep over the edge of the foreshore as it were a settlement of Central African huts imitated in iron. Bordered by the black and shining mud-flats the level marsh extends for miles. Away in the far background the land rises, closing the view with a continuous wooded slope, looking in the distance like an interminable rampart overgrown with bushes.

Then on the slight turn of the Lower Hope Reach, clusters of factory chimneys come distinctly into view, tall and slender above the squat ranges of cement works in Grays and Greenhithe. Smoking quietly at the top against the great blaze of a magnificent sunset they give an industrial character to the scene, speak of work, manufactures and trade, as palm groves on the coral strands of distant islands speak of the luxuriant grace, beauty, and vigour of tropical nature. The houses of Gravesend crowd upon the shore with an effect of confusion as if they had tumbled down haphazard from the top of the hill at the back. The flatness of the Kentish shore ends there. A fleet of steam-tugs lies in front of the various piers. A conspicuous church spire, the first seen distinctly coming from the sea,

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has a thoughtful grace, the serenity of a fine form above the chaotic disorder of roofs. But on the other side, on the flat Essex side, an enormous and desolate red building, a vast pile of bricks with many windows and a slate roof more inaccessible than an Alpine slope, towers over the bend in monstrous ugliness: the tallest, heaviest building for miles around, a thing like a hotel, like a mansion of flats (all to let), exiled into these fields out of a street in West Kensington. Just round the corner, as it were, upon a shore defined with stone blocks and wooden piles, a white mast, slender like a stalk of straw and crossed by a yard like a knitting needle flying the signals of flag and balloon, watches over a set of heavy dock gates. Mast-heads and funnel tops of ships peep above the ranges of corrugated iron roofs. This is the entrance of Tilbury Dock, the most recent of all London docks, the nearest to the sea.

Between the crowded houses of Gravesend and the monstrous red-brick pile on the Essex shore the ship is surrendered fairly to the grasp of the river. That hint of loneliness, that soul of the sea which had accompanied her as far as the Lower Hope Reach abandons her at the turn of the first bend above. The salt acrid flavour is gone out of the air together with a sense of unlimited space opening free beyond the threshold of sand-banks below the Nore. The waters of the sea rush on past Gravesend, tumbling the big mooring buoys laid along the face of the town; but the sea freedom stops short there, surrendering the salt tide to the needs, the artifices, the contrivance of toiling men. Wharves, landing-places, dock gates, water-side stairs, follow each other continuously right up to London Bridge; and the hum of men's work fills the river with a menacing, muttering note as of a breathless, ever-driving gale. The water-way so fair above and wide below flows oppressed by bricks and mortar and stone, by blackened timber and grimed glass and rusty iron, covered with black barges, whipped up by paddles and screws, overburdened with craft, overhung with chains, overshadowed by walls making a steep gorge for its bed, filled with a haze of smoke and dust.

This stretch of the Thames from London Bridge to the Albert Docks is to other watersides of river-ports what a virgin forest would be to a garden. It is a thing grown up, not made. It recalls a jungle by the confused, varied, and impenetrable aspect of the buildings that line the shore not according to a planned purpose but as if sprung up by accident, from scattered seeds. Like the matted growth of bushes and creepers veiling the silent depths of an unexplored wilderness they hide the depths of London's infinitely varied, vigorous, seething life. In other river-ports it is not so. They lie open to their stream, with quays like broad clearings, with streets like avenues cut through thick timber for the convenience of trade. I am thinking now of river-ports I have seen; of Antwerp for instance, of Nantes or Bordeaux or even old Rouen, where the night watchmen of ships, elbows on rail, gaze at shop windows and brilliant *cafés*, and see the audience go in and come out of the opera house. But London, the oldest and greatest of river-ports,

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does not possess as much as a hundred yards of quays upon its river front. Dark and impenetrable at night, like the face of a forest, is the London's waterside. It is the waterside of watersides, where only one aspect of the world's life can be seen, and only one kind of men toils on the edge of the stream. The lightless walls seem to stand on the very mud upon which the stranded barges lie; and the narrow lanes coming down to the foreshore resemble the paths of smashed bushes and crumbled earth where big game comes to drink on the banks of tropical streams.

Behind the growth of the London waterside the docks of London spread out unsuspected, smooth, and placid, lost amongst the buildings like dark lagoons hidden in a thick forest. They, too, are hidden in the intricate growth of houses, but for a cluster of mast-heads here and there overtopping the roofs of a seven-storey warehouse.

It is a strange conjunction that of roofs and mast-heads, of walls and yard-arms. I remember once having the incongruity of the relation brought home to me in a practical way. I was the chief officer of a fine ship just docked, with a cargo of wool from Sydney, after a ninety days' passage. In fact we had not been in more than half an hour, and I was still busy making the ship fast to the stone posts of a very narrow quay in front of a tall warehouse. An old man with a grey whisker under the chin, and brass buttons on his pilot cloth jacket, hurried up along the quay hailing my ship by name. He was one of those officials called berthing masters; not the one who had berthed us but another, who apparently had been busy securing a steamer at the other end of the dock. I could see from afar his hard blue eyes staring at us as if fascinated, with a queer sort of absorption. I wondered what that worthy sea-dog had found to criticise in my ship's rigging. And I too glanced aloft anxiously. I could see nothing wrong there. But perhaps that superannuated fellow craftsman was simply admiring the ship's perfect order aloft, I thought, with some secret pride; for the chief officer is responsible for his ship's appearance, and as to her outward condition, he is the man open to praise or blame. Meantime the old salt (ex-coasting skipper was writ large all over his person) had hobbled up alongside in his vast shiny boots, and, waving an arm short and thick like the flipper of a seal, terminated by a paw red as an uncooked beefsteak, addressed the poop in a muffled, faint, roaring voice as if a sample of every North-Sea fog of his life had been permanently lodged in his throat. "Haul 'em round, Mr. Mate," were his words. "If you don't look sharp you'll have your top-gallant yards through the windows of that 'ere warehouse presently." This was the only cause of his interest in the ship's beautiful spars. I own that for the time I was struck dumb by the bizarre associations of yard-arms and window panes. To break windows is the last thing one would think of in connection with a ship's top-gallant-yard, unless indeed one were an experienced berthing master in one of the London docks. This old chap was doing his little share of the world's work with proper efficiency. His

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little blue eyes had made out the danger many hundred yards off. His rheumaticky feet, tired with balancing that squat body for many years upon the decks of small coasters, and made sore by miles of tramping upon the flagstones of the dock side, had hurried up in time to avert a ridiculous catastrophe. I answered him pettishly I fear, and as if I had known all about it before: "All right, all right! Can't do everything at once." He remained alongside muttering to himself till the yards had been hauled round at my order, and then raised again his foggy thick voice. "None too soon," he observed, with a critical glance up at the towering wall of the warehouse: "That's a half sovereign in your pocket, Mr. Mate. You should always look how you are for them windows before you begin to breast your ship in, to the quay." It was good advice. But one cannot think of everything or foresee contacts of things apparently as remote as stars and hop-poles.

The view of ships lying moored in some of the older docks of London has always suggested to my mind the image of a flock of swans kept in the flooded backyard of grim tenement houses. The flatness of the walls surrounding the dark pool on which they float brings out wonderfully the flowing grace of the lines on which a ship's hull is built. The lightness of these forms devised to meet the winds and the seas makes, by contrast with the great piles of bricks, the chains and cables of their moorings appear very necessary, as if nothing less could prevent them from soaring upwards and over the roofs. The least puff of wind stealing round the corners of the dock-buildings stirs these captive ships fettered to rigid shores. It is as if the soul of a ship were impatient of confinement. Those masted hulls relieved of their cargo become restless at the slightest hint of the wind's freedom. However tightly moored they range a little at their berth, swaying imperceptibly the spire-like assemblages of cordage and spars. You can detect their impatience by watching the sway of the mast-heads against the motionless, the soulless gravity of mortar and stones. As you pass alongside each hopeless prisoner chained to the quay you hear the slight grinding noise of the wooden fenders as it were a sound of angry muttering. But after all it may be good for ships to pass through a period of restraint and repose, as the restraint and self-communion of inactivity may be good for an unruly soul. Not indeed that I mean to say that ships are unruly; on the contrary they are faithful creatures, as so many men can testify. And faithfulness is a great restraint, the strongest bond laid upon the self-will of men and ships on this globe of land and sea.

This interval of bondage in the docks rounds each period of a ship's life with the sense of accomplished duty, of an effectively played part in the work of the world. The dock is the scene of what the world would think the most serious part in the light, bounding, swaying life of a ship. But there are docks and docks. The ugliness of some docks is appalling! Wild horses would not drag from me the name of a certain river in the North country whose narrow estuary is inhospitable and dangerous, and whose docks are like a nightmare of dreariness and

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misery. Their dismal shores are studded thickly with scaffold-like, enormous timber structures, whose lofty heads are veiled periodically by the infernal gritty night of a cloud of black dust. The most important ingredient for getting the world's work along is distributed there under the circumstances of the greatest cruelty meted out to helpless ships. Shut up in the desolate circuit of these basins, you would think a free ship would droop and die like a wild bird put into a dirty cage. But a ship, perhaps because of her faithfulness to men, will endure an extraordinary lot of ill-usage. Still I have seen ships issue from certain docks like half-dead prisoners from a dungeon, dishevelled, overcome, wholly disguised in dirt, and with their men rolling up white eyeballs in black and worried faces raised to a heaven which, in its smoky and soiled aspect, seemed to reflect the sordidness of the earth below. One thing, however, may be said for the docks of the Port of London, on both sides of the river. For all the complaints of their insufficient equipment, of their obsolete rules, of failure (they say) in the matter of quick despatch, no ship need ever issue from their gates in a half-fainting condition. London is a general cargo port, as is only proper for the greatest capital of the world to be. General cargo ports belong to the aristocracy of the earth's trading places; and in that aristocracy London, as it is its way, has a unique physiognomy.

The absence of picturesqueness cannot be laid to the charge of the docks opening into the Thames. For all my unkind comparisons to swans and back-yards, it cannot be denied that each dock or group of docks along the north side of the river has its own individual character. Beginning with the cosy little St. Katherine's Dock lying overshadowed and black like a quiet pool amongst rocky crags, through the venerable and sympathetic London Docks with not a single line of rails in the whole of their area, and the scent of spices lingering over the muddy pavement between its warehouses with the far-famed wine-cellars, down through the interesting group of West India Docks, the fine docks at Blackwall, on past the Galleons Reach entrance of the Victoria and Albert Docks—right down to the vast gloom of the great basins in Tilbury, each of those places of restraint for ships has its own peculiar physiognomy of aspect and expression. And what makes them unique and attractive is their common trait of being romantic in their usefulness.

In their way they are as romantic as the river they serve is unlike all the other commercial streams of the world. The cosiness of the St. Katherine's Dock, the old-world air of the London Docks, remain impressed upon the memory. The Docks down the river, abreast of Woolwich, are imposing by their proportions, and the vast scale of the ugliness that forms their surroundings, ugliness so picturesque as to become a delight to the eye. When one talks of the Thames Docks beauty is a vain word, but romance has lived too long upon this river not to have thrown a mantle of glamour upon its banks.

The antiquity of the port appeals to the imagination by the long chain of

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adventurous enterprises that had their inception in the town and floated out into the world on the waters of the river. Even the newest of the docks, the Tilbury Dock, shares in the glamour conferred upon it by the historical associations of its name. Queen Elizabeth has made one of her progresses down there, not one of her journeys of pomp and ceremony, but an anxious business progress at a crisis of national history. The menace of that time has passed away, and now Tilbury is known by its docks. These are very modern, but their remoteness and isolation upon the Essex marsh, the days of failure attending their creation, invested them with a romantic air. Nothing could have been more striking than those vast empty basins, surrounded by miles of bare quays and the ranges of cargo sheds, where two or three ships seemed lost like children in a forest of gaunt, hydraulic cranes. One received a wonderful impression of utter abandonment, of wasted efficiency. From the first the Tilbury Docks were very efficient and ready for their task, but they had come perhaps too soon into the field; but a great future lies before the Tilbury Docks. They will never fill a long-felt want (in the sacramental phrase that is applied to railways, tunnels, newspapers, and new editions of books). They were too early in the field. The want will never be felt because, free of the trammels of the tide, easy of access, magnificent and desolate, they are already there, prepared to take and keep the biggest ships that float upon the sea. They are worthy of the oldest river port in the world.

And truth to say, for all the criticisms flung upon the heads of the dock companies, the other docks of the Thames are no disgrace to the town with a population greater than that of some commonwealths. The growth of London as a well-equipped port has been slow, while not unworthy of a great capital, of a great port of distribution. It must not be forgotten that London as a seaport has not the backing of great industrial districts or great fields of natural exploitation. In this it differs from Liverpool, from Cardiff, from Newcastle, from Glasgow; and therein the Thames differs from the Mersey, from the Tyne, from the Clyde. It is a historical river, it is a romantic stream flowing through the centre of great affairs. And for all the criticism of the river's administration my contention is that its development has been worthy of its dignity. For a long time the stream itself could accommodate quite easily its oversea and coasting traffic. That was the time when in the part called The Pool, just below London Bridge, the vessels moored stem and stern in the very strength of the tide formed one solid mass like an island covered with a forest of denuded trees. And when the trade had grown too big for the river, came the St. Katherine's Docks and the London Docks, magnificent undertakings answering to the need of their time. And so of the other artificial lakes full of ships that go in and out upon the waterway leading to all parts of the world. The labour of the great London river goes on from generation to generation, goes on night and day. Nothing ever arrests its sleepless industry but the coming of a heavy fog, which clothes the teeming stream in a great impenetrable stillness.

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After the gradual cessation of all sound and movement only the ringing of ships' bells is heard, mysterious and muffled in the white vapour from London Bridge right down to the Nore, for miles and miles, in a decrescendo tinkling where the estuary broadens out into the North Sea, and the anchored ships lie scattered thinly in the channels between the sandbanks of the Thames' mouth. Through the long and glorious tale of years of the river's strenuous service to its people these are its only breathing times.

*** *We regret to announce that the important contribution by Mr. Hall Caine which we had intended to publish in the present issue is unavoidably held over, the distinguished novelist having been unable, owing to indifferent health, to complete the article in time for this number. The extraordinary interest taken throughout the world in all that Mr. Hall Caine writes is sufficiently shown by the amount of controversy now raging around the questions raised by his latest novel. We have pleasure in announcing that the article will appear in our January number.—Editor,* THE WORLD'S WORK AND PLAY.

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BORIS SARAFOFF DICTATING THIS ARTICLE

THE DESPERATE OUTLOOK IN MACEDONIA

THE CONDITION OF MACEDONIA UNDER THE TURK IS AS BAD AS EVER—THE RIVALRY OF THE POWERS—NOTHING HAS BEEN ACCOMPLISHED BY THE EUROPEAN OFFICERS FOR THE BENEFIT OF CHRISTIANS—A BOGUS REFORM SYSTEM—HOW THE INSURGENTS ARE EQUIPPED—"WE ARE GOING TO FIGHT ON"—AUTONOMY OR ANARCHY

BY

BORIS SARAFOFF

Boris Sarafoff, the writer of the following article, is a member of the Revolutionary Committee of Macedonia, an organisation with which the Sultan, with all his forces from Asia, is powerless to cope. The Turk can play the Great Powers of Europe one against another, and continue to deceive them with endless promises, but the little band of desperate men—who will not parley, who ask no quarter and give none, who war with dynamite against European as well as Turk—threaten to send the Mohammedan invaders back to the land from whence they came. Sarafoff is the most noted of the "Committajis" (Committee-men, as they are called by the Turks) for his methods of fighting the Turks and Europe have been the most violent. He was president of the committee formed in Bulgaria to assist the Bulgarians of Macedonia to attain their freedom when Miss Stone was captured by an insurgent band, and held for ransom for the purpose of augmenting the funds for the late revolution.

THE uprising of the Christians in Macedonia last year was suppressed by the Turks with a severity sufficient to make even those long-suffering and oft-deceived people put some hope in the new promises of the Powers of Europe. But their hope was of short duration, and they find themselves to-day faced with the alternatives of submitting to the same barbarous treatment which was meted out to them before the revolution, or renewing the struggle.

The reform scheme of the Powers, which was

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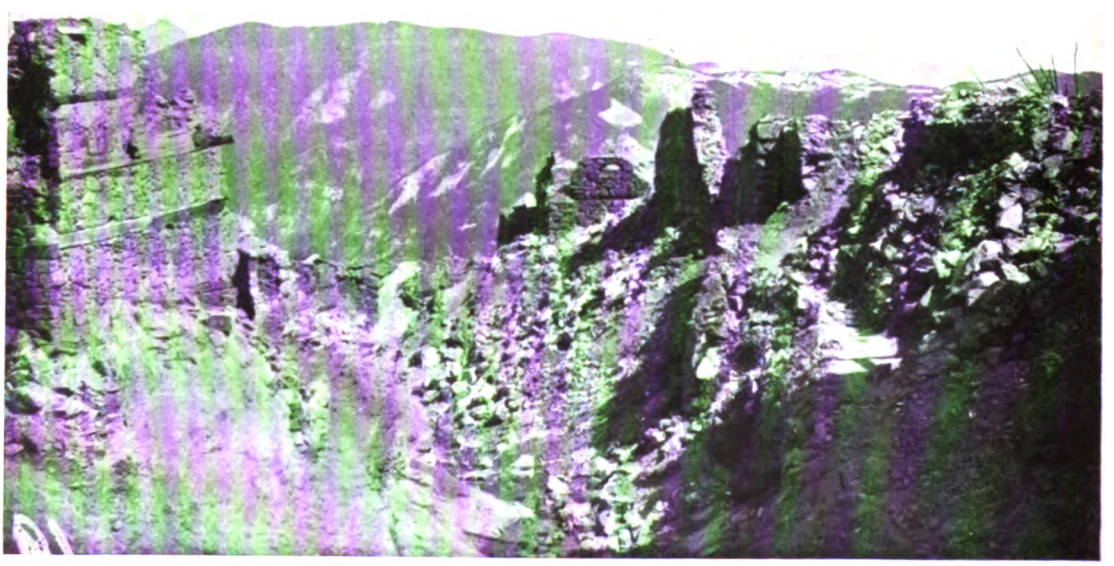
the outcome of the massacres the uprising brought about, promised to make Christian lives safe and bearable. In detail, the Powers planned to institute law courts which would punish the Mohammedan who slew the Christian wantonly, took his property without just recompense, sold his child for use in slavery or dishonoured his wife or daughter—all of which villainies are now practised without interference on the part of the authorities. The Powers planned to reorganise the method of tax collecting, whereby a man who has purchased from the Government (often at a price far beyond what he could legally collect) the right to gather the tithe, stalks through the country with an armed escort, and extorts from the peasants anywhere from 10 to 60 per cent. of their crops. The only way to oppose this extortion is by force of arms, for the word of a hundred Christians does not stand in the law courts of Turkey against that of one Mohammedan. But for a Christian to possess a weapon is warrant for anything, from a brutal beating to slaughter on the spot, according to the mood of the Turks who discover the fact.

The reform scheme was comprehensive in its promises. It promised to reorganise the gendarmerie, now composed of brigands, murderers, and highway robbers; every man of them, and a large proportion of the officers, illiterate. Christians were to be appointed to the service in proportion to their numbers in each district—which would be the great majority. The reform scheme even went back into the past and promised to exact funds from the Turkish Government for rebuilding the towns and villages destroyed by the Turkish soldiers last year.

To effect all these changes two civil agents, a Russian and an Austrian, were assigned to "assist" Hilmi Pasha, the Turkish Governor of the Rumelian provinces, under whom the massacres of last year were committed, and twenty-five foreign officers,* five each from Austria, Russia, England, France, and Italy, were appointed to "reorganise" the gendarmerie. The presence of the foreign officers throughout the country was the thing upon which the Powers based their best hopes, and that to which the Turks took most objection. The Turks have a great and well-founded dread of Europeans witnessing their methods. When the new scheme was laid before him, supported by all the great European Powers except Germany, the Sultan, seeing he would be forced eventually to accept it in some form, tried to eliminate the gendarmerie section, and caused the then-existing gerdarmerie to be

* At the time of this writing Austria and Russia are making an effort to increase the number.—B. S.



A MACEDONIAN VILLAGE AFTER THE TURKS HAVE PASSED

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A BAND OF INSURGENTS, TWENTY OF WHOM ARE NOW MAINTAINING THE REVOLUTIONARY ORGANISATION IN MACEDONIA

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"reformed" at once. All the "Christian" spies and guides who had served the Turkish army in its late work of slaughter and devastation, were enlisted, and Abdul Hamid supplied funds to pay up all back wages. But these reforms did not satisfy the Powers and they insisted upon their plan being accepted "in effect." So it was the task of the Turks to defeat the foreigners in the field.

The civil agents and the officers went to Macedonia. The civil agents took up their residence at Salonica with Hilmi Pasha, and the contingents of foreign officers selected sections of the country in which to work, and repaired to their chosen districts.

Salonica is the largest town in Macedonia, a seaport which foreigners are constantly visiting. It is kept, therefore, comparatively free of atrocities. Only once have the civil agents penetrated the interior to investigate the condition of affairs there. The Turks insist that they are not to go into the country except in company with the governor general (who only moves to Uskub or Monastir, the capitals of the other two villayets of Macedonia) and that their emissaries shall travel and make inquiries only with a Turkish official (who notes names and, after the foreigners depart, causes examples to be made of any Christians who dare to bear ill-evidence against the Government).

The gendarmerie officers are not to receive complaints from the peasants. Their duty is to "reorganise" the gendarmerie. They have not command of the gendarmes and are permitted simply to "instruct" and "suggest." This arrangement was agreed to on the plea of the Turkish Government that the Mohammedan dignity should be considered. To be commanded by a Christian is degradation to a Turk. In consequence any suggestion of the officers which affects the condition of the people is not acted upon, and the progress which the officers are making, if any, is on military lines solely. Abdul Hamid is not unwilling to have his army (of which the gendarmerie is a part) drilled and organised by European officers. Every advance the gendarmerie makes in proficiency makes it more effective against peasants who dare to rise, while provocation for rising is being mitigated in no way.

ALBANIAN RECRUITS FOR THE TURKISH ARMY

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BULGARIAN SOLDIERS PRAYING BEFORE DINNER

The famous Monastery of Rilo, on the Bulgarian-Turkish Frontier, where so many of the victims of Turkish ill-treatment have been succoured

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The first work in reforming the gendarmerie is to weed out the criminals, who corrupt the whole service. The Austrian officers at Uskub recently attempted to remove a certain gendarme of whose complicity in some crime they had received positive evidence. Count Salis, the commanding officer, called on the Turkish commander, and demanded the removal of the objectionable gendarme. The Turkish official, with the usual Turkish politeness, wrote out the man's discharge without a question in the

AUSTRIAN GENDARMERIE OFFICERS AND TURKISH OFFICERS ABOUT TO LEAVE USKUB FOR THE INTERIOR

Austrian's presence. Some days later the Austrians discovered that the man was still in the service and the Count called on the commander again and protested. He received assurance that the neglect to fulfil his "suggestion" was an error, and that the discharge should be put into execution at once. But a week later the Austrians had again to protest. Again they received an apology and a promise. This fiasco was kept up until Count Salis despaired, and the criminal in question is a gendarme to-day saluting the Austrian officers whenever they pass him.

The Italians in the Monastir district, the most important section of all, have been hopelessly defeated. They have abandoned all efforts at doing anything, which has caused the suggestion to be made in the European Press that perhaps their government has reached a secret agreement with the Sultan, such as exists between Russia and Abdul Hamid. The French and the Russians have accomplished nothing, but the English report having had several unjustly imprisoned Christians freed and causing two corrupt officials to be removed. The Turks often display their leniency by releasing a prisoner on the request of a foreign official of some standing; the man set free generally suffers a double sentence at a later date. They also remove officials under firm demand, and reward them with better posts in other districts.

The English are naturally the most successful of the foreign contingents. The Turks know that England has no design upon their land, they feel grateful to England for lending them her weight and influence on so many occasions, and the English officers are off in an unaffected district peopled by Turks, who do not complain against the Government because "it is Allah's will" that it should be what it is, and by

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MACEDONIANS ON THEIR WAY TO EXILE

Parties of Macedonians are exiled in chains to Asia Minor on every Thursday from Salonica

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BULGARIAN PRIESTS

All the orthodox clergy of Macedonia let their beards and hair grow long, and always wear the garb here portrayed

Greeks who still cling to the hope of reviving a great Greek empire.

But if the gendarmerie throughout all Macedonia could be reorganised, of what value would it be? Suppose the gendarme could be taught to arrest the bandit and not his victim, the Turkish tribunal before whom the robber appeared would set him free for a share of the booty. The Turkish tribunal receives no pay. The Austrian and Russian civil agents are endeavouring to obtain an appropriation in order to pay regular salaries to the tribunals and obviate the necessity of their selling judgments. The Sultan has displayed his accustomed tardiness in paying his officers. Perhaps he reasons that regular salaries would not alter the condition of his courts.

It is not unfair to say that the peasants of Macedonia pay in legal and illegal taxation quite 40 per cent. of the results of their annual labours, quite ample to make every official rich enough to be honest. The country is as rich as it is magnificent, and even at the enormous legal taxation the peasants would be well-off were they permitted to raise and sell all the land would yield. But it is useless for them to produce much more than their own requirements, for trade is confined to the district markets, and prowling soldiers fill their bags from hampers which dare to be fuller and better than their neighbours.

Quite half of the tax money gathered never gets to the Ottoman treasury. The other half goes into the public coffers, but is again divided by the officials, who expend it, a proportion going into their own pockets and the remainder to the purchase of arms and ammunition. The Turk's sole idea of government is suppression. For the tremendous taxation he pays, the Macedonian peasant gets no roads for his teams, no schools for his children, no courts of justice, no protection for his life or the honour of his women folk; every farthing he pays goes into the private pockets of his oppressors or into guns and swords to keep him paying. The abuse in the method of tax collecting is an item on the civil agents' programme for adjustment. Recently these gentlemen have made the announcement that the Turkish Government has agreed to try a new system, whereby the tithe gatherer cannot collect more than the legal percentage of the harvest, in twenty villages in the Monastir district each year. A trial—in twenty villages—one year hence! When will an equitable system be in operation in three thousand villages?

The Christian peasants of Macedonia are suffering from the same injustices, robberies, persecutions, murders, dishonour of their women folk, and all the list of Turkish crimes, under the very eyes of the foreign officers as they suffered before the revolution. The Turks have

GENERAL DE GEORGIS

The Italian Commander of the new Gendarmerie

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A GROUP OF BASHI-BAZOUKS

Nominally, irregular troops; actually, often brigands

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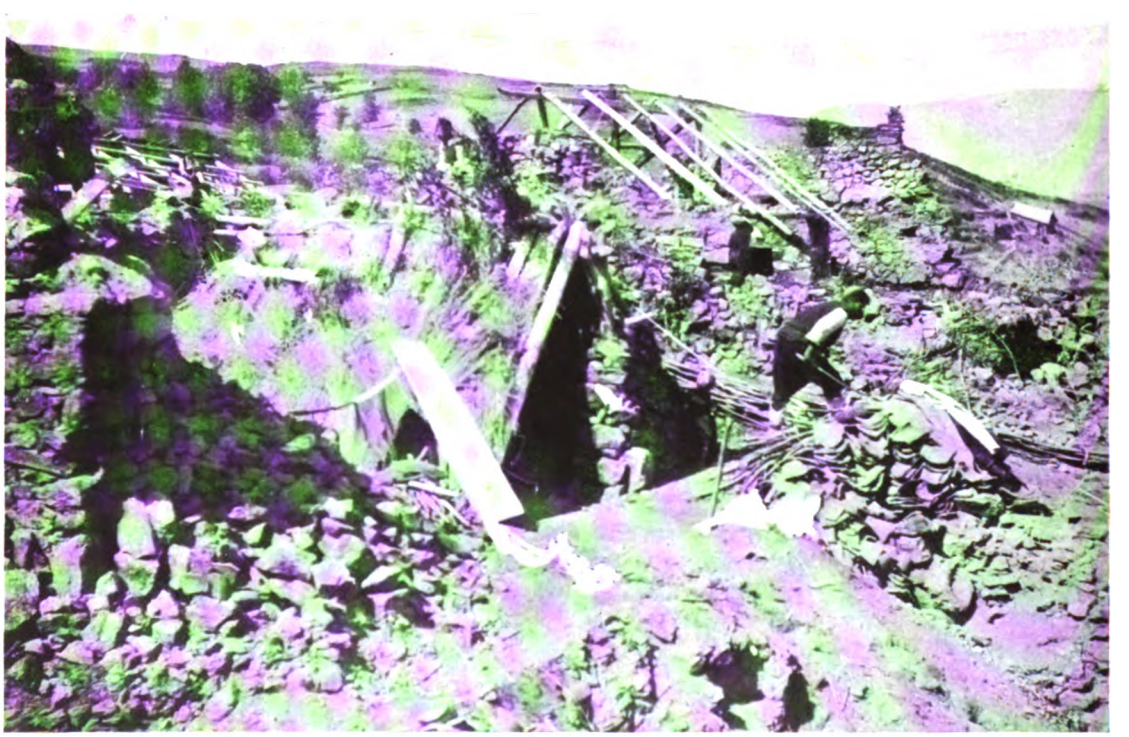
TYPES OF MACEDONIAN INSURGENTS
A leader and his lieutenants

succeeded in defeating the reformers at every point, and the foreign officials have accomplished in a year not one permanent adjustment of a chronic abuse. Not a village of the hundred odd which were destroyed last year has been rebuilt, and thirty thousand people are living in brush hovels amid the ruins with barely enough to eat to keep body and soul together.

The Revolutionary Committee and the enlightened men of the country realised how ineffective the reform system was upon its promulgation, and abandoned all hope for any effective change in the lot of the unhappy people when Austria and Russia, the two Powers most interested in acquiring sea-coast on the Mediterranean, set aside the proposal of Great Britain to appoint a Christian governor over the province, and commissioned instead the Austrian and Russian civil agents to "assist" Hilmi Pasha, Abdul Hamid's instrument of butchery. The Macedonians have no desire to exchange the rule of King Log for that of King Stork. We do not intend to sit still under the present condition of affairs, with our wounds covered, until "the two most interested Powers" are prepared to display them to Europe, shock the civilised world, and enter to "adjust" the disgraceful condition of South Eastern Europe.

We are going to fight on in Macedonia. We saved about two-thirds of the number of guns we had in the revolution last year, and we have still much unused dynamite. Of cartridges



MACEDONIAN PEASANTS REBUILDING THEIR WRECKED HOME WITH BRITISH MONEY

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and ready money we had not sufficient to renew the struggle effectively this year. But we have maintained a skeleton of the revolutionary organisation by means of which the spirit of the people is kept kindled for another rising at an opportune moment. We have seventy bands, numbering from ten to twenty men each, in the mountains at present. These are doing no fighting against the Turkish troops except when discovered and attacked. When a massacre and plunder or other gross outrage occurs, such as the recent affair at Gomeji, the Turks are made to pay a penalty—if not in blood, then in money, or destruction of railway or other property by dynamite. Such retaliation is not inflicted solely in a spirit of revenge; it is meant to keep alive in the Turkish Government a wholesome respect for the Internal Revolutionary organisation.

BORIS SARAFOFF IN SOFIA
With two acquaintances, a Russian and a Japanese

The Turkish Government has recently commissioned private bands of Albanians and Turkish brigands to hunt down our bands, the Turkish army being unequal to the task, but these "Bashi-bazouks" find it far more profitable to ply the trade of brigands. Seven of the Mohammedan bands came in contact with the insurgent bands, and the result in each case was the total annihilation of the former. So they have now turned their attention to extorting ransoms by threats of murder, or burning property and kidnapping; and most unfortunate for the insurgent cause is the fact that their letters are written in Bulgarian purporting to come from the Internal Committee. This is doubtless one of Hilmi Pasha's clever schemes. A significant incident took place a few months ago at Salonica. One of the civil agents called on Hilmi Pasha, and requested that some action might be taken to recover two children who had been carried off by these brigands, and held for ransom. The Governor General replied that he thought it best to take no action, for sending troops after the brigands would disturb the peaceful state of the country. The civil agent insisted that some effort should be made, and Hilmi Pasha replied that the Turkish Government would prefer to pay the ransom. But, of course, the ransom was not paid, and I fear to say what became of the captives, for they were both Bulgarians.

There are but two ways to make life bearable in the Christian lands dominated by the Turk. One is to reform Constantinople—a hopeless task—the other is to amputate the Christian provinces. You cannot cure a limb of a diseased trunk. That nothing can change as long as the Turk rules, has been proven times innumerable, but the European Powers, fearful and jealous of one another, take turns in befriending him, defending him at the times when his exit from Europe would not favour them. As for sympathy for the Christians who have suffered untold tortures for five hundred years, because they refuse to abjure their faith and follow Mohammed, there is none in the world. Eighty thousand Armenians were massacred at Abdul Hamid's order, while Russia, ever professing sympathy with suffering Christians, and England, which had pledged herself to protect them, held their guns at each other. Material interests will affect Europe, and only material interests. European trade in European Turkey must be destroyed, and Turkey-in-Europe must be kept a menace to the peace of Europe.

One of the reasons advanced why Macedonia should not be granted autonomy is its variety of conflicting races. It is said that autonomy would be no solution of the Balkan question. The Macedonian peasants are simple folk who want only to be allowed to live in liberty, and when assurances for life and honour and property are given them, political agitators and propagandists can exist no longer in their land. The present enmity between Greek, Serb, Bulgar, and Vlack is an entirely false one, infused into their spirits by the propagandists of the respective Balkan states, encouraged

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by Powers interested in maintaining a balance of weakness among them, and fostered by the Turks that they may rule by their subject's disunion. Under an autonomy, the propaganda would end, Macedonia would have its own schools and churches, and Greek, Vlack, Bulgar, and Serb would become Macedonians, and Turk and Albanian would be eligible to the same title if they should choose to come under it. There are Turks in Servia, Roumania, and Bulgaria. They are better off in Servia than they are in their own land; the gendarmerie and other offices are open to them in Roumania, and in Bulgaria seven of them sit in the Sobranje as representatives of the Mohammedan districts.

The longer Macedonia remains a part of Turkey, the closer Austria and Russia weave their web about the Balkans. As long as Macedonia remains under the Turk, anarchy shall prevail.

Anarchy or autonomy!

"COME OVER INTO MACEDONIA AND HELP US!"

A demonstration appealing for aid in front of the British Agency at Sofia

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THE LARGEST TELEPHONE EXCHANGE IN THE WORLD—THE CENTRAL, LONDON

In this Post-Office Exchange there are 9500 lines actually working

THE PROGRESS OF THE TELEPHONE

TELEPHONES AND TEMPER—A VISIT TO THE NATIONAL AND POST OFFICE EXCHANGES IN LONDON—PRECAUTIONS TAKEN TO ENSURE SMOOTH SERVICE—THE GREAT GAIN OF THE NEW CENTRAL BATTERY SYSTEM—UNAPPRECIATED FACILITIES

BY

GEORGE TURNBULL

Illustrated from photographs specially taken for THE WORLD'S WORK

EVERY man in his time has been a savage at the telephone. He has not been able to help himself; the telephone puts his temper to a test peculiarly its own, and the telephone gets the last word. How many men are there in London offices to-day who do something incalculably rash after being foiled by the telephone? How many a home is less happy because its master has been affected overwhelmingly by the erratic behaviour of this innocent-looking instrument for good or ill? How many generous impulses have been checked in how many bosoms by the contact with this strong thing, which is impervious to feeling, which knows no reason, which heeds not when you cry? It would be difficult to say. Eighty thousand telephones are at work in London to-day, and their possibilities for annoyance to the testy subscriber are immense. We can imagine a man who dare not use the telephone for fear of losing his temper.

The telephone shares with other things the opprobrium that attaches to the imperfect. There are few things in the daily life of the business man that extract the extreme praise of "perfect." His train is often late. His American mail often fails. He cannot depend upon his electric light. His most valued subordinates are sometimes ill—and no valued subordinate ought ever to be ill or unavailable. And so on. The telephone is no exception. It is mightily convenient when it is in form; when it is stupid, it is stupid to the last degree of hopelessness. In your disappointment you ignore all claims of gratitude the telephone has upon you for previous services, and you marvel bitterly at the invention of so fickle a thing. But when you recover and put the two in the scale, you find that the good

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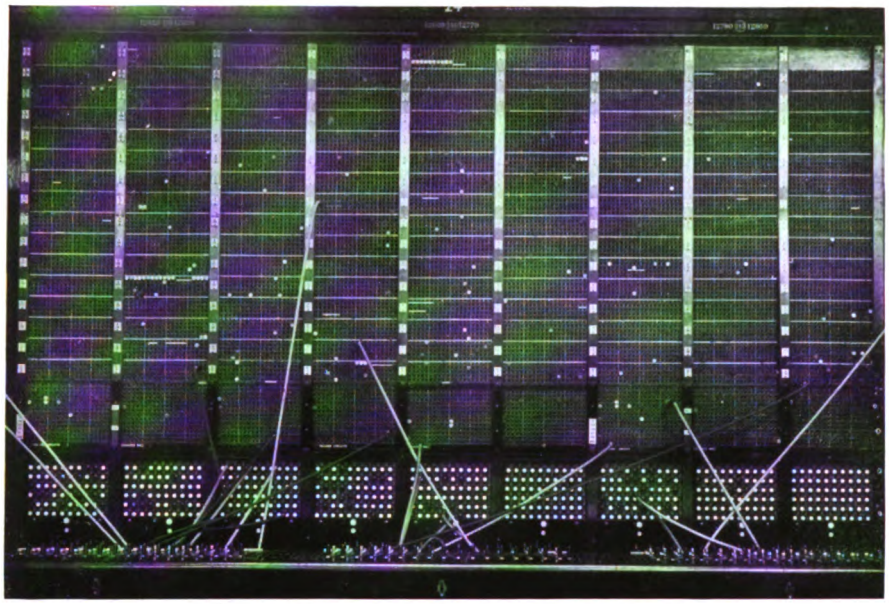
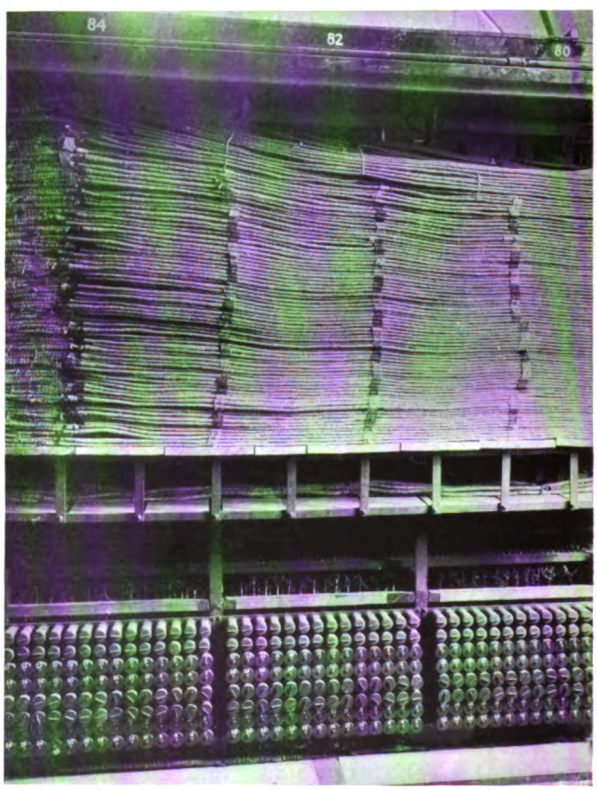


SECTION OF A MULTIPLE SWITCHBOARD

The operators sit in front of this as at a piano. Each operator has a receiver, which fits close to her head, and a breastplate transmitter. She thus speaks and hears without having to use her hands for the instrument. Both hands are left free to manipulate the cords and plugs

behaviour far more than balances the bad behaviour of the telephone. The scale bumps down heavily on the side of an indispensable aid to modern life.

Of all methods of disarming the telephone subscriber who is angry, a visit to a telephone exchange is the most convincing. There you will see the rows of girl operators sitting, each opposite her allotted clients on the switchboard—silent, busy, never swerving from the duties of her little sphere. Behind every ten girls a supervisor walks along, casting her eye here and there over the work of the girls to see that everything is going on well. Or the supervisor may sit down at her desk in the middle of the floor and "tap" any of the operators to hear what is passing between them and the subscriber, and whether the subscriber is being attended to—or chatted with. Before they get their position the operators have gone through a special training, besides, of course, passing a medical examination. They are first of all subjected to a general examination to ascertain whether they are intelligent enough, for the telephone operator must be good tempered, alert, and well educated. Then they go to "school" to learn the theory and practice of telephony. After two months at "school" they are ready to go to whichever exchange requires them, and in this matter the telephone manager will study to place a girl in the exchange that is nearest to her home, which reminds us that knowledge of the geography of London forms a prominent feature in her training. The day of the telephone operator is seven and a half to eight hours, and in the large exchanges the girls have a dining-room where usually an excellent meal is obtained at a very moderate



THE BACK OF THE SWITCHBOARD

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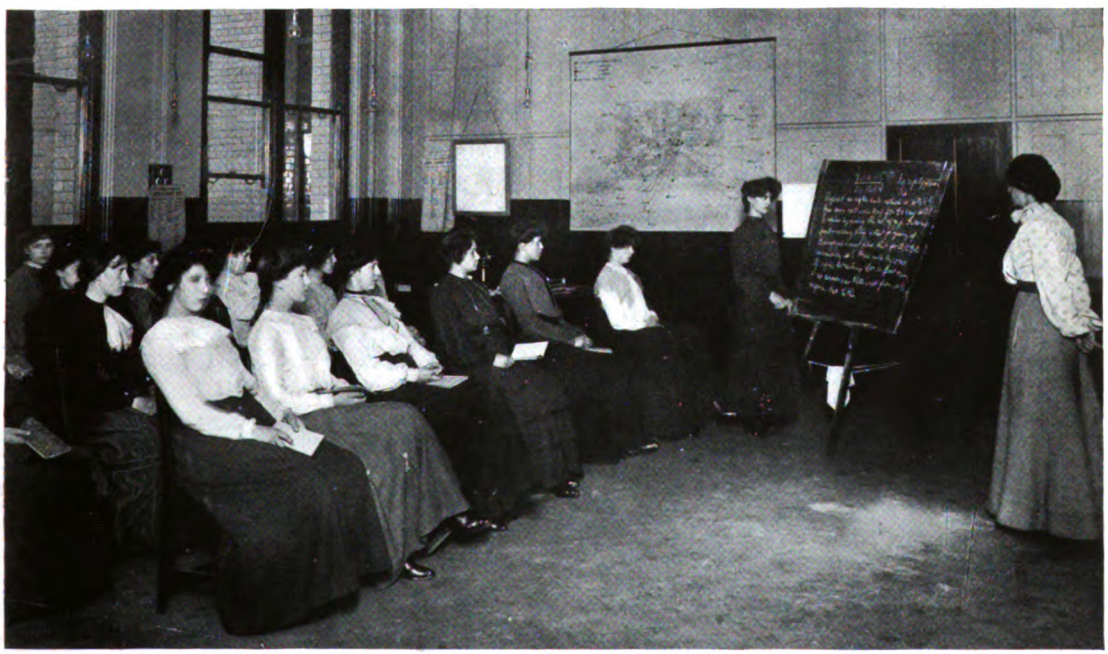
cost. At the Central, for example, the walls of the dining-room are furnished with beautiful pictures which have been bought out of the profits made.

Every possible precaution is taken to prevent mishap or disappointment in your conversation. Nothing that can be avoided seems to be left to chance. Sincerity is everywhere apparent in the character of the service in a telephone exchange. Sincerity is a personal attribute, but then one must remember that the irate subscriber has invested the telephone with personality. What is the personality? Some may associate the Manager, some the Chairman, some the Clerk-in-Charge, in whose department complaints are received to be inquired into minutely, and a little history kept of every fault. But surely the personality of the telephone resolves itself in the majority of cases into that of the operator at the exchange, the "telephone girl."

Let us see, then, the operator at her work. The writer has done so in two of the important telephone exchanges in London—the Central (Post Office) and the Gerrard (National Telephone Co.). And this brings us to a great advance which has recently been made in the telephone apparatus. The largest exchange in London, perhaps even in the world, is the Central, situated within a stone's throw of St. Paul's Cathedral. It is two years since the Post Office set up in business in opposition to the National Telephone Company, and during that time it has installed some twenty thousand telephones. Here—though not here only—one may see in operation what has been rapturously described as the "last word in telephony." Less poetically, it is the central battery system. If it has not penetrated to your place yet, be sure it is coming, for not only is it the system employed by the Post Office, but it is also in operation in three National exchanges—Holborn, Kensington, and Battersea—while a fourth, Barnsbury, is in the act of getting it, and a fifth, London Wall, will have it by the end of the year. The central battery system has the advantage of being a gain at both ends of the wire. It is a gain to the subscriber, because all the apparatus he need have in his office is a receiver and transmitter, and the bell—that is to say the hand generator and the battery at the subscriber's end are abolished. It is a gain to the telephone authorities because they have the batteries and generators under their noses, so to speak, in their own building, instead of in the subscriber's office or house. The subscriber does not ring; when he wishes to call for a number he only unhooks the receiver from its



A LESSON IN TELEPHONY

These girls are at the Post-Office school, and after passing their "exam." will be drafted into the service. An operator begins at 11s. a week, and there are prizes in the exchange rising to £140 and even as high as £180

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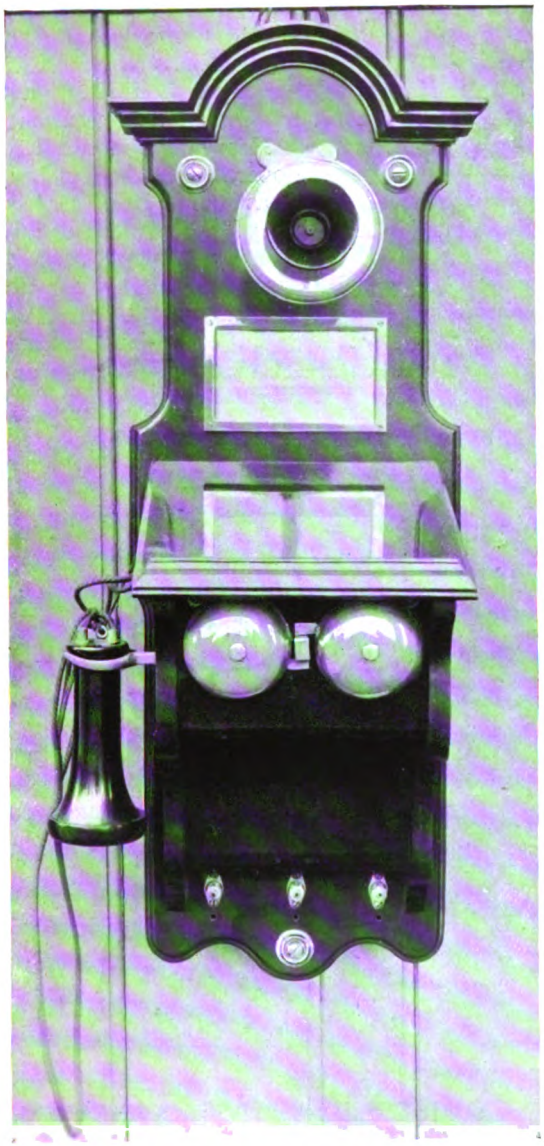


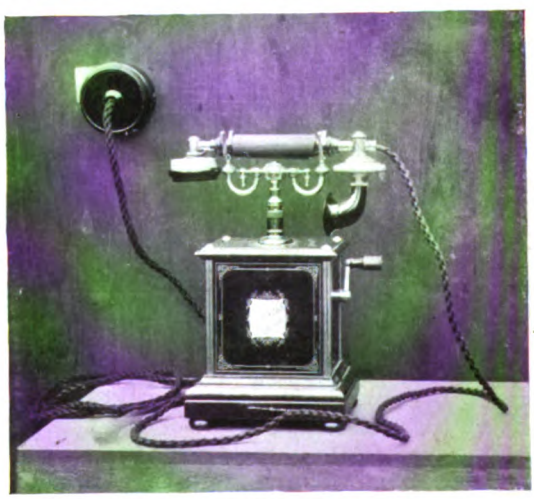
THE LATEST WALL TELEPHONE

This instrument is fitted with a fixed type of solid back transmitter mounted on an arm, which allows of a certain amount of adjustment up and down to suit the varying heights of the users. On the top is the magneto-bell by means of which the attention of the subscriber is attracted. The receiver is of the double-pole type and fitted on a vulcanite case as shown on the left of the instrument. This normally rests on a switch hook, which is actuated by the weight of the receiver; when this is lifted off a signal is given to the exchange by means of a small electric lamp which glows in front of the operator whose duty it is to attend to the particular subscriber. The principal feature of this instrument is its extreme simplicity both in construction and in the manner of using, it being only necessary to lift the receiver to call (as above described), and when a conversation is completed, to place the receiver on its hook, which immediately signals the exchange by means of another electric lamp, whereupon the operator severs the connection

rest, and the telephone exchange knows. The bell formerly signalled to the exchange, but in the Central-battery system the act of signalling is automatic. When you take the telephone

A TABLE TELEPHONE

This shows the table-set used in common battery installations. This makes a very neat and simple arrangement which can be placed on a desk or table and is readily moved from one place to another. The bell in this case is fixed separately and can be fitted in any convenient position where it can be heard. The method of calling and operating is similar in every respect to the Wall Telephone set described on this page



A "MAGNETO" TABLE SET

This shows the latest pattern of table-sets designed for magneto exchanges, a noticeable feature being that all the working parts are entirely enclosed so that dust and dirt, which might interfere with the proper working, are entirely excluded. The attention of the exchange is gained by turning the handle shown on the right-hand side of the instrument; this works a magneto generator in the interior, which sends a current along the line and drops an indicator or lights a lamp in front of the operator. The instrument is fitted with a Hand Micro-Telephone that is a receiver and transmitter combined, which allows conversation to be carried on with great ease, but it is found that for long-distance working this is not so effective as the fixed pattern adopted for common battery working. To signal the exchange that conversation is completed, it is necessary to replace the Hand Micro-Telephone on the rest, and turn the handle of the magneto which actuates a clearing indicator or lamp at the exchange (National Telephone Co.)

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off the rest in your office or your house that particular girl (in the row of operators sitting in the exchange) who has your line to attend to, sees a little incandescent glow, rather smaller than a shilling piece, light up in front of her by the side of your telephone number. The first thing the operator does when this lamp glows is to put herself in touch with you, the subscriber. This is the work of a second, for she has only to pick up a metallic plug, connected with a flexible cord conductor, and insert it into the spring jack, or switch, above the lamp. The switchboard in front of the operator is "perforated" (to the observer at least they do look just like perforations) with the mouths of these jacks, like an enlarged set of the marks left on a man's face after a severe attack of smallpox. The "jack" may be non-technically described as the entrance gate by which you gain access to whomever you want to speak to; and the work of the operator may be characterised as putting you upon the track. As a glance at our photograph of the back of a multiple switchboard will show, behind the board are thick masses of wires and connections, communicating with the batteries beneath. Each "jack" has two metal strings, and these are connected to the two wires of the subscriber's line. To return then to the operator: having received your call by the glow of the lamp, she plugs your jack, and thereby the lamp is extinguished. She is now able to speak to you, and learns the number you want; then picking up a second plug, she puts it into the spring-jack of that number on the switchboard. Now she presses a button to call the required subscriber. This causes the bell to ring in the office of the subscriber who is wanted. The operator must also know whether the person who is wanted answers the bell, and this again is a matter of lamps, for when the subscriber's telephone is on its hook, the two lamps that are associated with the cords in the jack light up in the exchange, but if the telephone is off the lamps go out. Hence, when the lamps remain glowing she knows the subscriber she wants is not attending to his instrument—perhaps he is out. But if he is there and takes his telephone off the hook, the connection is made and the two parties speak to each other. When their conversation is ended and they put their telephones on the hooks again, that act causes the two lamps to glow, and the operator knows the line is clear, and therefore disconnects. This she does by withdrawing the plugs from the switches, whereupon the lamps are extinguished.

Now suppose the number wanted happens to be engaged. The meaning of the multiple switchboard is that each operator can connect with every subscriber on her exchange. That is to say, supposing there are four thousand subscribers and each operator has ten clients to attend to, she can—having within her reach on the board jacks communicating with every number—connect any of these ten with any other member of the four thousand. But as the same is the case all the way round the room, it will be easily seen that a number might be engaged by one operator when it comes to be wanted by another. What the operator is doing, therefore, when she plugs the required line, is to test that line in the switchboard before her. If the line is already engaged for some one at another part of the switchboard, the operator on putting the plug in gets what is called the "engaged" click, and she then plugs the subscriber into a special jack connected to a machine which emits to the subscriber's ear that unwelcome buzz which is the announcement of an engaged line.

So far we have seen what happens when you call up a subscriber who is connected with the same exchange as yourself. But we must also understand what takes place when the person you want is on another exchange. For the purpose of making this connection there are, in every exchange, what are called "junction lines"—that is, lines connecting any one exchange with another. These junction lines are divided into two lots—one for messages outgoing from the exchange, the other for messages incoming to the exchange. The multiple switchboard at which the operator sits contains, therefore, not only the multiple jacks and the answering jacks, but also the outgoing junction jacks. This system, in a word, means communicating the number wanted to the exchange in which that number is situated, and when the answer is received from that exchange, making the connection, or replying that the line is engaged, as the case may be. And here we meet with a difference between country exchanges and London exchanges, which has to be pointed out to the telephone user before it can be appreciated. Suppose a man in Brighton is speaking to another man in Brighton, he is connected instantly, because the subscribers are all dealt with in one exchange. But in London you may have to speak to a subscriber who is miles away in quite a different area from that in which you are situated. Here the junction wire comes into operation, and there is a

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certain amount of waiting. The complexity of wires leads to delay—and the complexity of wires in London may be imagined when you know that London has over sixty telephone exchanges. It has been shown that, in the country, 90 per cent. of the calls can be dealt with by the exchange which receives the calls, whereas in London something like 85 per cent. of the calls are "foreign," necessitating the use of junction wires.

Still another division of the telephone service is that relating to conversations between London and the country. In this case your call must pass on to the trunk exchange at the Central, as the Post Office is the owner of the long-distance, or trunk, lines. The trunk exchange is situated over the general exchange, and is a new room hardly yet filled up. It has just recently been removed from the General Post Office, and space has been left in it for inevitable extension. Whether, then, you are on the National or on the Post-Office system in London, if you call for a number say in Liverpool, Glasgow, or Inverness; Paris, Marseilles or Brussels, or elsewhere outside the metropolitan area, your call passes through this trunk exchange, situated in that same building near St. Paul's Cathedral. The London exchange that wants a number in the country for a subscriber, communicates with the trunk exchange in the same way as it would with any other exchange. Getting through takes about twenty minutes to half an hour. You may speak to Paris for three minutes for eight shillings, and about three hundred people do it every day; to Inverness for 5*s.* 6*d.*; or to Cork for 6*s.* 6*d.*, for a three minutes' talk.

The cost of a telephone in London is £17 a year for an unlimited number of calls in the London area. But a system which is becoming increasingly popular—especially on the Post-Office service—is that of the message rate. You pay a penny for every call in London and £5 for the rent of the apparatus, and you must use 30*s.* worth of calls in the year. This, naturally, is especially favoured in residential districts, such as Kensington. For the business man, however, who is using his telephone at almost every minute of the day, it may safely be said that cost is a secondary question. What he wants is an efficient service, and he is willing to pay well for it.

On the whole it will probably be found that the service in London deserves the name of efficient, and, at any rate, it is always improving. After all, everything cannot be controlled by the telephone authorities. Suppose a plumber or a builder's man on the roof finds a bevy of telephone wires in his way. He may, as likely as not, go and tie them all together until his job is finished, heedless of the pandemonium he is causing in fifty different places. When fifty complaints have to be inquired into and a mechanic is sent over the ground to find what has happened, there is, of course, no trace left of the plumber man's little device. Circuits may fail, and the wires may be put in contact for simplest causes; but the subscriber must in fairness remember that he is not always as careful as he might be in attending to his instrument. It was proved eventually, in the mysterious case of a lady who repeatedly complained of not being able to make herself heard, that she did not speak into the instrument at all! And as a majority of telephone users have still got the old magneto instrument, it is polite to remind them that neglect to ring off is a very common vice.

The value of the telephone needs no emphasising at the present day. It is a time-saver and a money-saver; it is an indispensable adjunct to business life. But it is doubtful whether it is yet generally realised that subscribers can communicate with non-subscribers, rapidly and at a very small cost. For example, a subscriber in Kensington wants to speak with a friend in Sydenham who is not on the telephone. He calls up the Post Office at Sydenham and asks the clerk to take down the message he desires to send. The clerk does so, and the message is delivered by special messenger. If a reply is required it can be prepaid, and the messenger boy will wait for the answer and bring it back to the office, when it will be telephoned to the subscriber in Kensington. Under this arrangement thirty words can be sent for threepence—or a saving of a shilling as compared with a telegram. This service is not only available in London; you can communicate to other towns, on payment of the ordinary trunk telephone fee in addition to the express service fee. It is possible also for a subscriber to send a telegram at any hour of the day or night by dictating it over his telephone circuit to a telegraph office. Letters, too, can be dictated for the ordinary post, and messengers can be summoned for the collection and delivery of messages and parcels. It is splendid—but you must bring good humour to it, and in your darkest moments at the 'phone call up the memory of your brightest.

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THE MARCH OF EVENTS

OUR SECOND BIRTHDAY—A RECORD OF STEADY PROGRESS—MR. BALFOUR'S SILENCE—THE DUKE'S GREAT SPEECH—HOW TARIFF REFORMERS FORM THEIR OPINIONS—THE NORTH SEA OUTRAGE AND OUR DIPLOMACY—THE WAR AND PEACE

BY

HENRY NORMAN, M.P.

ONCE more we have to celebrate a Birthday of THE WORLD'S WORK. Two years ago this month the attempt was made to establish a Magazine which would deal seriously, promptly, instructively, and entertainingly with the various activities of the world connected with national efficiency and social progress. All concerned in its foundation believed that such a magazine was needed, and that public support for it would be forthcoming. The result has shown that we were right. The last issue of THE WORLD'S WORK is out of print and we were unable to fulfil Messrs Smith and Son's second repeat order. Its sale has been larger than that of any issue except the first since we started. During the past month we have added more annual subscribers to our list than in any month of our existence. We believe we have a larger subscription list outside the United Kingdom than any serious, non-technical magazine published here. Our bound volumes enjoy a steadily increasing sale. During the past year of bad trade we have had more than our share of the best advertising, and what our advertisers get in return may be seen from a facsimile letter reproduced in the present number. We are assured privately and in the Press that our contents grow steadily in interest, and our monthly selection is made from articles and illustrations offered to us from all over the world. We hope that this first number of our fifth volume shows that we are determined to improve upon our past. It is our object to produce a magazine so interesting, so helpful, so instructive, so entertaining that nobody who desires to keep abreast of the progress of the world in general and of his own country in particular can afford to do without it. To be month by month instructive without being dull, and entertaining without being trivial—to present a readable, trustworthy, fully illustrated monthly record of the work that is being done in all fields of human activity, at home, in the Empire, and in the world—that is our aim. To all—readers, subscribers, advertisers, and contributors—who have helped us to approach its realisation, we tender our hearty thanks.

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Last month I remarked that the Prime Minister's speech at the meeting of Conservative Associations at Southampton would settle the misty question of the relations of himself and Mr. Chamberlain on the fiscal question. The remark seems comical to-day in the light of what happened. Mr. Balfour appeared before a great meeting thrilling with the keenest anxiety to know what he would say on this politically vital matter—and said not one word about it! He contented himself with uttering three columns upon the relations of England and Russia. Therefore nobody in the country has the least idea whether Mr. Balfour supports the Chamberlain policy or whether he does not. Among his own followers both attitudes are confidently attributed to him. The situation has become farcical. One plain word from Mr. Balfour would clear up the whole situation, but he will not say it. "Nothing would have been easier," as the *Spectator* remarked, "than for the Chief Whip to have acted as Mr. Balfour's mouthpiece in making the situation clear." In fact, Mr. Balfour is like the drunken man who, to the appeals of his wife and his friends, responded, "I will do anything in reason, but I won't go home!"

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The Prime Minister will do anything in reason, but he will not tell the country whether he is for Mr. Chamberlain's policy or against it. The *Spectator* has no doubts on the question. "Unionist Free Traders must face the fact that Mr. Balfour is not going to throw over Mr. Chamberlain." I fully agree that the Prime Minister's silence suggests this interpretation. On the facts, he and Mr. Chamberlain are working together to capture the citadel of British Free Trade. The latter is hammering on the defences from outside, while the former, inside, is pushing the keys to him under the gate. But I cannot bring myself to believe that this is the true interpretation, and that Mr. Balfour is such a mere juggler with words as it implies. Until absolutely convinced of the contrary I shall continue to hold that there *is* a breach of opinion between the two men. Any other view is, in my opinion, too dishonouring to Mr. Balfour. And this view finds support, too, in the fact that Lord Salisbury, who is not only a Cabinet colleague of the Prime Minister, but his relation and intimate friend, declared (1) that the Conservative party, "dazzled by a great Imperial dream," had been "carried away by the enthusiasm of a very great but rather impulsive statesman," and (2) that the Government did "not desire the support of the reckless, the vehement, or the impulsive." Lord Salisbury is awkward in the use of words, but it is hardly conceivable that this double use of the word "impulsive" was accidental. At any rate, Mr. Matthew White Ridley, M.P., intimately associated with Mr. Austen Chamberlain, has written angrily to the *Times* demanding to know what Lord Salisbury meant by it. It may be, as is believed in some quarters, that when the fiscal fog lifts Mr. Balfour and Mr. Chamberlain will be found to have drifted far apart. The truth cannot be concealed much longer. Meanwhile, let us believe the best we can of the Prime Minister—at least, that he used words in their ordinary significance, and that he meant what he said.

* * * * *

I have often wondered how Tariff Reformers get their opinions from the facts, for the facts point one way and their opinions the other. A certain interesting light has recently been afforded me on this interesting problem. At Southampton Mr. Balfour said not a word on the fiscal question. Now, the *Hampshire Advertiser* is the leading Conservative newspaper of the county, and in its issue of October 29, which contained a full report of Mr. Balfour's speech, the editorial comment began with these words:

"The great meeting last night was of the most enthusiastic description, and all present listened with profound attention to Mr. Balfour's declarations on his fiscal policy. Nothing could be more straightforward or plainer, and yet his lucid and direct statements will be wilfully misinterpreted by the Radical party. All their doubts and difficulties would at once disappear if they only read Mr. Balfour's words in their simple, natural meaning, instead of attempting to read into them other meanings and hidden intentions."

The editor had written his comment upon the speech before it was made, and this part of the paper had gone to press and could not be recalled! "Nothing could be plainer" than the statement Mr. Balfour did not make! "Radicals will wilfully misinterpret" the words he never uttered! So Tariff Reformers come by their opinions. It is very instructive and very funny.

* * * * *

The re-election of President Roosevelt was a foregone conclusion, but nobody foresaw that he would be the most popular President since Abraham Lincoln. His victory is sweeping beyond the calculations of his most sanguine friends. His contagious energy, his buoyant enthusiasm, his high character, his clean administration, his embodiment of most of the characteristics of the best American sentiment have carried all before them. The Democratic candidate brought very serious charges against him. He simply remarked that they were "falsehoods," and nothing more was heard of them. His personality and his policy are triumphantly approved. It may safely be added that if Englishmen had possessed votes for the Presidency, almost all of them would have been cast for him, so high is the respect in which he is held in this country.

Now for the first time and for four years, the world will see the real and unhampered Theodore Roosevelt. He has now been elected President; hitherto he was President by accident. He has received an overwhelming popular mandate to be himself. He has nothing to fear and nothing to hope, for he has announced that he will never be a candidate again. In both the Senate and House of Representatives there will be a Republican majority; therefore his policy will not be impeded by opponents. He is free, within the limits of the Constitution, to do as he will.

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If occasion for strong action should arise, the world will see what a strong man armed can do. The British people will have no anxiety regarding his influence, which they are glad to see is likely to be great, upon international affairs.

For Mr. Bryan, however, the election has been a negative victory. The Democratic party cast him and his ideas and policy and warnings aside. They have suffered a worse defeat than has ever befallen them. Now he and his political associates will proceed, with all the prestige of the confirmed prophets, to organise their party on the old lines, gathering to them all the elements of popular dissatisfaction and disaffection. Should bad trade and bad harvests occur during the coming four years, with a growing monopoly by Trusts and a worsening of the already strained relations between capital and labour, their following will be great and dangerous. Nobody who knows America well will be very confident in denying the possibility that 1908 may see in the United States a social crisis of the gravest possible character.

* * * * *

A fortnight ago I wrote an article for a newspaper upon the terrible incident on the Dogger Bank. When I read the proof of it I realised that it could not be published, with opinion in England in the state it then was. The article contained the reflections which are in all our mouths to-day, and which I am about to write here.

A more shocking occurrence than the shooting of unarmed fishermen peacefully engaged in their calling, with their trawlers practically at anchor, by a powerful battle fleet which steamed on and neither stopped to discover what harm it had done nor to render assistance to the sinking fishing-boat, could hardly ever have occurred in time of peace. Upon so much we are all agreed. Further, the fullest apology, the amplest indemnity, and the strongest assurances that such an act should not be repeated, were imperatively demanded, and if these had been refused, the whole might of the British Navy would rightly have been called upon to enforce them. There could be no difference of opinion up to this point.

Precisely what demands were sent by the British Government to the Russian Government we do not know. An apparently official communication, however, issued to the Press, included one other thing and implied yet another. The first was, that the officers who had committed the act should be punished; the second, that Russia should accept our version of the facts. This, I repeat, was not stated, but the whole attitude of the Government, so far as we are able to judge, implied it. Anybody looking at the situation with the calmness demanded by its extreme gravity, saw at once that, in this shape, the demands would not be complied with by any great nation able to fight. What would have been our own attitude if any other government had charged British naval officers with the grossest incompetence or worse, and had demanded that we should promise to punish them before we had ourselves investigated their conduct? It is no wonder, in view of a situation like this, that, for several days, we were on the verge of war. It seems safe to say that four persons saved us from this catastrophe: the King, because, though we have no knowledge of what he did, it may be taken for granted that his Majesty's wisdom and great influence were thrown heavily into the scale on behalf of an honourable peace; the Tsar, because it has now been stated by the Prime Minister that he had "shown himself an enlightened judge of what is right as between nation and nation"; M. Cambon, the French Ambassador in London, because he represented, on behalf of the peace-loving French Republic, the extreme danger of the situation produced by our demands, and the only way in which war could be avoided; lastly, Count Benckendorff, the Russian Ambassador, whose calmness and discretion on this, as on many other occasions, have been of incalculable value in the relations of the two countries. No more disgraceful episode has occurred in recent years than the insulting of this most courteous and friendly gentleman by a crowd of rowdies at Victoria Station. It is freely stated that those who committed this outrage were not Englishmen, and indeed one hopes that this may have been the case.

The Tsar, then, proposed that the matter should be submitted to the Hague Tribunal, to determine the facts, and the suggestion was promptly accepted. The solution is an ideal one, and we may all unite in regarding it with profound thankfulness. It marks a new era in international disputes. One's only regret is that this most civilised proposal did not originate in one's own country. Most people, now that the hot fit has passed, will admit that our original communication to Russia should have been couched in some such terms as these: "We consider that the facts show us to have suffered a gross outrage; you hold that the

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facts are in doubt; let us submit the facts to an independent body of judges; if they are pronounced to be as we claim, then we formulate the following demands: apology, indemnity, security for the future; if you do not accept this proposal, it is war." Such an attitude would have been approved by all nations. It would, if we were right in our view of the facts, have secured us in either event everything to which we were entitled. It would have been the attitude of a great nation, bent upon preserving peace if possible, but, in the alternative, ready to use its strength without hesitation when national honour demanded.

Happily, this solution has been reached, but by a devious road. One shudders to think how near we were to war, and when one remembers the positive exhilaration with which much of the Press and many of one's acquaintances discussed its probability.

It may be well, now that the danger is over, to reflect a little upon what such a war would have meant. To begin with, we should have sunk or captured any of the vessels of the Baltic Fleet which did not succeed in reaching a neutral port. Then our great navy might have retired to harbour, since there would have been nothing else for it to do. We should have had to despatch as quickly as possible 200,000 men to India—with the army in the state to which the Government has reduced it! A new war loan of £100,000,000 would have been the next step, accompanied by a drop of ten points in Consols. Trade, now slack, and needing, above all things, a long period of fiscal and military repose, would have fallen off to a point where our industrial classes would have suffered one of the blackest winters of living memory. There is no point at which we could deal Russia a vital blow. If no other country had intervened, the war would have dragged on without possible victory for either side. If any other nation had intervened, there is no telling the limits to which the struggle might have been expanded. It seems to me probable that under such circumstances Russia would have made terms with Japan. With perfect justice she might have declared that she could not fight both Powers simultaneously, and therefore, without humiliation, she might have agreed to give Japan the terms, and better, which she refused last winter. There can be no reflection upon the honour of Japan in this view, for I cannot see that any consideration of honour would have required Japan to continue a war in which she had already gained everything that she sought. Moreover, is it suggested that we should have brought pressure to bear upon Japan to carry on a war she had already won, in order that we might the better fight Russia? I hope not. If the war in the Far East had ceased, the Russian army would have been conveyed in due course back over the Siberian railway, thence by the newly opened line, 13,000 miles, from Orenburg to Tashkent, the capital and military focus of Central Asia, and thence to Merv, which is thirty-six hours by rail. From Merv it is one hundred and ninety miles by rail to Khusk Post, which is eighty miles from Herat. Moreover, General Kuropatkin knows Central Asia better than any soldier living, and every Russian private would have grasped at last what he was fighting for, namely, the dazzling plains of India. When we had finally won, what should we have gained by our victory? Perhaps a slice of Bokhara!

On the other hand, the war would have been even more disastrous to Russia. That she could force her way to India through Afghanistan is out of the question. It is the veriest bogey. No Russian statesman or soldier of eminence believes it. At no other point in the world could she touch us. Her trade, already so injured by war, would have received a further and almost fatal blow. Another loan for her would have been out of the question. No possible satisfactory outcome of the war for her would have been conceivable.

Such a war would have strained to the utmost our now amicable relations with France, and would have vastly strengthened, at our expense, the only nation from which we have an armed attack to fear, namely, Germany. Such was the war contemplated for several days by a considerable proportion of the inhabitants of these islands, with equanimity, if not, as I have said, actually with exhilaration. And this sentiment, it must be admitted with the profoundest regret, was fanned by a part of the Press in a manner almost appalling. Nobody in this country thinks more highly of our Press than I do, or has its welfare more at heart, yet in the face of such another outburst as we have recently witnessed, I should be compelled to support the establishment of an official censorship in times of international crises. For days, no words of personal insult were too gross or too vulgar to be applied to the Russian Admiral and his officers. It was taken for granted that at least they must all have been intoxicated. Every naval man

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knows perfectly well that it often happens in our own manœuvres that a fleet fires upon its own torpedo boats, or upon fishing-boats mistaken for them. Without in the least attempting to detract from the shocking character of the action of the Russian fleet, it might at least, in the absence of evidence to the contrary, have been assumed that a terrible blunder had occurred. Yet the *Times*, of all newspapers, allowed its special correspondent at Hull to state categorically "I have no doubt whatever that the outrage was deliberate." Now that the danger is over, recriminations are useless, but, as a warning for the future, let us not forget that one London daily paper inflamed opinion for two days in succession with a positive statement of an "Ultimatum to Russia" which "expires this afternoon," and "Time limit expired": that another said of the Russian Admiral, "The man must be either mad, or drunk, or is a liar"; and a halfpenny evening paper alluded to the Russian commander, on its contents bills, as the "Mad Dog Admiral." One of the most experienced journalists living said to me at that time, "Unless something is done to stop these people, they will involve us some day in a hideous catastrophe." It is needless to add that a large number of papers preserved their usual sense and dignity. But at such a crisis the irresponsible and sensational minority exert a disastrous influence at home and abroad.

Upon one other matter it is now necessary to speak frankly. Lord Lansdowne's speech at the Mansion House was a model of strong, sober, and statesmanlike utterance at a moment of crisis. What he said then, the Prime Minister ought to have said a week before. He was perfectly in a position to do so, for as he himself stated, the danger was over when he went to Southampton. Yet, having submitted the matter to an independent tribunal, and thus seen it safely *sub judice*, he proceeded to deliver himself of three columns of *ex-parte* comment upon it. He chaffed the Russian Admiral, to the accompaniment of the "laughter" of his hearers, pronounced upon the facts, to the cries of "Lies!" and "Liar!" by Conservative gentlemen, and generally argued the whole case. It was enough to make the late Lord Salisbury turn in his honoured grave. Even the *Morning Post* was moved to comment severely upon this extraordinary breach of custom:

"What we cannot understand is that at the very moment when Mr. Balfour has referred the matter to an International Tribunal he should be declaiming against the Russian Admiral whose conduct that tribunal is to investigate, and should be expressing his own strong opinion on the very matter in regard to which his Government has abandoned its power of independent action."

I do not hesitate to say that every Foreign Office and every diplomatist in the world must regard the Prime Minister's speech at Southampton as an offence against international etiquette almost without parallel. And that Mr. Balfour should do this to escape the alternative necessity of a clear statement upon the domestic issue which is keeping the whole country in political suspense and commercial uncertainty, was surely an amazing evasion of personal and official responsibility.

* * * * *

The air is full of talk of peace, the French Chamber has ratified the Anglo-French Convention; Mr. Hay has proposed to the Powers, in a most lucid and masterly communication, a further conference upon the abatement of armaments. All this is indeed most welcome. The awful carnage in Manchuria and around Port Arthur disposes even the most callous and the most bellicose to turn a willing ear. Is there any prospect of this sentiment finding a practical issue at the present stage of the war? Mediation is being urged with great force in France, and would be most gladly supported in England and America. For myself, however, I deeply regret to say that I can detect no sign of its success. So far as I can see, the situation remains as I stated it in these pages six months ago. If Russia can possibly continue the war, she will do so. To accept defeat at the hands of an Asiatic people would be an irremediable disaster to her. Her troops in the field are now equal in number to the Japanese, and their quality has increased steadily from the beginning, whereas the best Japanese troops have suffered enormous losses—far greater than we know, for the Japanese themselves have stated that they think it inadvisable to publish their losses before Port Arthur. The war is, as well as one can see, as far from an overwhelming victory for either side as it was months ago. Both sides are now preparing for a winter campaign, active or inactive. Already Japan is feeling keenly her enormous losses of highly educated and irreplaceable officers. She has just floated another small loan of £12,000,000 at ruinous terms, namely 6 per cent., issued at 92½, and secured on her Customs revenue. Of course this has been underwritten at less than the price of issue,

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whereas it is redeemable at par. For the last loan of £10,000,000 she received in cash, it is stated, only £8,200,000. On the other hand, the Brussels correspondent of the *Standard* states positively that a new Russian 5 per cent. loan of £54,000,000 is virtually arranged. In a very interesting and strikingly impartial book which has just reached me, by Mr. Douglas Story, an experienced war-correspondent and thoughtful observer (*The Campaign with Kuropatkin*, London: Laurie), I find these concluding words:

"Slowly Russia is awaking to the actuality of things in Manchuria, and with her waking comes Japan's great peril. So long as Russia flicked lazily at the enemy upon her far-stretched flank Japan could astound the world with the intrepidity of her attack. When Russia deigns to deal seriously with her antagonist a new page in history will be turned. General Kuropatkin has the nation at his back, a nation steadfast in determination, united in its realisation of the need to press on the war."

This was my view at the beginning, and I see no reason yet to change it. Of course, some great Russian misfortune, such as the breakdown of the Siberian Railway, might compel her to make peace, but those who know her best are most confident that she will fight to the end. No lack of appreciation of Japan is implied in the belief that she attempted a task beyond her strength. One can only wish fervently that some way might be found to end these awful losses by a settlement compatible with the interests and the honour of both combatants.

A RUSSIAN ON THE WAR

THE VIEWS OF COUNT LEO TOLSTOY, JUNIOR

WE have all read scores of articles during the last six months upon the Russian people and their view of the war, but these have been written by foreigners, or by Russians living—for reasons good or bad—outside their own country. No small part of the accounts of Russia in the English Press during the war has been written by members of the Russian revolutionary party. Unfortunately this fact is known to but very few of those who read these accounts. It is, at least, of equal interest to know the views of a well-known Russian of diametrically opposite views. Therefore our readers may be interested to see the following article from the pen of the son of the famous Count Leo Tolstoy. It represents, at any rate, a point of view which has found little expression in England.—EDITOR.

THESE are anxious times that we are living in. But I am convinced that they will pass away and be succeeded by days of brightness and joy; by an epoch of renovation for Russia.

Many voices are to be heard, deeply pessimistic and hopeless, or simply weary and languid, awakened by current events. But how pitiful, how unworthy these voices seem, contrasted with the wise, calm, and steadfast attitude of the Russian people toward the war, as toward every war in general.

I have spent two months in Central Russia, I have traversed it in several directions, and in spite of the sorrow, in spite of the want, which have naturally increased in the villages with the calling out of the reservists, I have rarely met men among the leading peasants who do not understand the significance of current events. As among the educated classes, so among the peasantry, people have separated into two parties.

Speaking frankly I have found the party of the malcontents, who do not understand the importance of the Russo-Japanese War, to be far less numerous than the party which realises that it is a great, inevitable, predestined, historical event. The majority of peasants with whom I have conversed, express themselves approximately as follows:

"What is to be done? One cannot fly from fate."

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"The Japanese has risen; he must be brought to reason."

"Many of our folk will perish. But he will suffer too. There is nothing to be done. There has been no war for a long time. Now it has broken out again. Though we do not want it, still it breaks out. Even though we would rather not go, still we must go."

Then would come the question: "You have not heard anything, sir, of its dying away, have you?"

"No, it is not dying away yet."

Nothing more. The peasant says no more, because he is wise.

I was at Tamboff, seeing my brother off to the war, and witnessed heartbreaking scenes, which brought a tightening into my throat.

A motley crowd of many thousands: peasant women, old men, children, and well-dressed citizens were seeing off a military train of forty carriages with forty soldiers in each. When the third bell rang and the train slowly rolled out of the station, the whole crowd was sobbing like one man.

The soldiers crowded in the open doorways of the carriages. One wept like a child, another was cutting jokes, a third was nodding farewell to his wife, his aged father, his children, a fourth was cheering, a fifth again struck up a song.

The train rolled away and the crowd suddenly surrounded an old peasant woman who had fainted away on the platform. I went up to look at her. Pale, with a waxen, deathlike face, she lay on her back in her clean coat of brown peasant cloth and neatly tied country shoes. Worn out with agitation, tears, and fatigue, she had swooned away.

And yet, for all these depths of sorrow, how wise and how righteous, as being wisely just, is the attitude of this same people towards what is called and what really is war, *i.e.*, a fight to the death for their race and for their country.

Let others say what they please, let them lament and add their weakness to that of their brethren; this will not undermine the unconquerable might of the Russian people; this will neither shake nor weaken it; at most it will only completely weaken the murmurers themselves.

The present war in the Far East is a great war, such as Russia has not seen since the days of Peter the Great. It is waged for the possession of the eastern coast of the great European and Asiatic continent, as in Peter's time wars were waged for the possession of the western coast.

As in our contest with the Swedes the battle of Narva preceded that of Poltava, in which the Swedish power was broken, so in our strife with the Japanese, those Asiatic Swedes, islanders whose geographic situation on the border of the continent is similar to that of Scandinavia, we must at first, and indeed already have suffered failure, but later another Poltava is inevitable, in which the power of Japan will be broken.

One must be extraordinarily pusillanimous and extraordinarily short-sighted not to foresee the final outcome of the war. For this a glance at the map is sufficient; a glance at Russia with her vast expanses, her fields and forests, her lakes and mountains, and her people, will convince us that she is unique in her geography, her climate and her people, with their spiritual and intellectual power, their temperament, their love of peace and their vocation, and that these must ensure her ultimate victory.

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BUNGALOWS FOR PEOPLE OF MODERATE MEANS*

HOW TO FIND A COUNTRY COTTAGE, AND HOW TO BUY OR BUILD ONE—OWNERS OF COTTAGES AND BUNGALOWS ON THEIR BUILDING EXPERIENCES —HOW TO DEAL WITH ARTISTS, ARCHITECTS, AND BUILDERS

BY

"HOME COUNTIES"

With estimates, plans, and photographs

"Here we rejoyce, because no rent
We pay for our poore tenement;
And bless our fortunes when we see
Our own beloved privacie."

A BUNGALOW (Bengalee, *bânglâ*) is, says Webster, "a house or cottage of a single floor, which is either thatched or tiled." A cottage, the same authority explains, "is any small, neat, and tasteful dwelling." These definitions are vague enough. But if we add to our dictionary-acquired information the fact that the two latest works on bungalow and cottage architecture do not, so far as I can see, provide plans for any dwelling to cost less than a thousand pounds, our definitions seem vaguer still. For two things are perfectly certain:

First, the two authors would certainly not prepare books of plans of bungalows and cottages at a thousand pounds apiece if this amount were not about the sum that many people think it expedient to lay out on such dwellings.

Second, there can be no doubt that when numbers of folk, many of our "people of moderate means," for instance, talk of building a bungalow or cottage, they certainly do not dream of spending £1000.

Undoubtedly before discussing the question of obtaining a bungalow or cottage, four points need to be settled:

First, is it going to be hired, bought, or built, and what is to be the distance from London?

Second, is it

(*a*) to be lived in all the year round, residence in town being given up for life in the country;

(*b*) to be occupied only in the summer months, or half the year at the outside; or

(*c*) to be used for week-ends only?

Third, what number of bedrooms and what accommodation for servants will be needed?

Fourth, is the garden required for kitchen produce as well as flowers, and is any additional land, a paddock or stabling wanted?

I. SEARCHING FOR A COTTAGE

If the district in which it is desired to live is not well known, it is decidedly wise to hire a cottage there for a year in order to discover whether the region has in reality all the attractions it is supposed to have. If it is proposed eventually to have a place for all the year round residence, it is well that one winter should be spent in the country. Many a townsman inclined to turn countryman does not realise until he makes experiment how very different winter in the country is from summer in the country.

In order to hear of a cottage to let or for sale, there is nothing like advertising in the county papers, taking systematic cycle rides in promising districts, and consulting innkeepers, farmers, shopkeepers, and corn merchants. As a class, "estate agents"—who may be anything from reputable and responsible firms to unscrupulous Jew auctioneers, house-painters, or petty representatives of insurance and coal companies—are a broken reed for the Back-to-the-Lander to lean upon. Even if honest and capable, they are of small service.

* *See* the illustrated articles, "Cheap Country Cottages: an Authoritative Account of the Legal Difficulties, and the various ways in which they may be got over" (THE WORLD'S WORK, October), and "Cheap Country Cottages: Practical Hints about Building them" (THE WORLD'S WORK, November).

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The commission they get on small properties is so small that they will not enter into correspondence or take any particular trouble on behalf of inquirers; in many instances they have not seen the properties on their books; and their assistants are often such lazy and consequential young persons—"estate agency" is considered "genteel" by rural bloods who lack the brains, the money, or the inclination to go into some more precise and exacting occupation—that the information they supply is as often as not incorrect or misleading. I speak exclusively from the experience of friends and myself.

There is no use disguising the fact that desirable cottages are not to be picked up easily nowadays near London. The dwelling on page 65 (rent, £25; accommodation: dining-room, sitting-room, four bedrooms [two small], kitchen, scullery and larder, barn, large garden and a quarter-acre paddock with some fruit-trees; the whole prettily situated), and the attractive cottage illustrated on page 487 of the October number of THE WORLD'S WORK (rent, £20; accommodation: dining-room, sitting-room, study, two bedrooms, small kitchen, servant's bedroom, pantry and convenient outbuilding, with nice garden) are not more than thirty miles from London as the crow flies, though more by train, but the fact that one of them is to let is due to chance more than to the fact of being four miles from a station and in a retired district. The rents stated are on a three years' lease, without any covenant on the landlord's part to do repairs. Essex is probably the lowest rented of the Home Counties. Suffolk would be cheaper than Essex. It is difficult to get anything at a low figure in Surrey, Kent, or Sussex, and rents in Hertfordshire, Buckinghamshire, and Berkshire have also gone up. Difficult, but not impossible, of course: the industrious cyclist will continue to be rewarded by finds. Right away from London and remote from large towns "wonderful value" can still be got; but every year the rents of cottages for letting to other than labourers are rising.

II. OVERHAULING OLD COTTAGES

To buy a cottage is often an economical way of going to work; but it is a mistake to suppose that because a cottage is low-priced it is quite as big a bargain as it may seem at first sight. I bought last year a cottage for £95, but I am sure my additional outlay in putting it to rights has brought my expenditure to more than two hundred guineas; and if I were going to live in it myself I should like to spend another £50 on it. It is the easiest thing in the world to spend on a cottage, which may have cost twice the original price of the dwelling to which I refer, as much again as the purchase money. The drawback to this is not that the owner does not get satisfaction out of his improvements—because he does—but that, looked at as an investment, it is easy to spend more in a very few years than would be got back again if the property had to be sold. I know a case in which as much has been spent on two new cottages as they cost, and there would probably be some difficulty in covering the expenditure had they to be sold.

The plans on page 64 show how it was proposed to add to the old cottage on page 65. I reproduce them because they are drawn from a design by a well-known man, Mr. Maurice B. Adams, and because they are excellent in themselves for a tenant with a family. I may add, what is of importance, that the landlord was unwilling to carry them out, because he did not think that the property stood in sufficiently large grounds to justify so extensive a building, and he was not convinced that the investment would be sufficiently secure, looking to the rent which it would be requisite to charge over a term of years. The cost of the improvements was estimated at £800; but it is doubtful, bearing in mind hot and cold water supply and the necessity of a new well and incidentals, whether the expenditure would not have risen appreciably beyond that. It should be noted that a considerable proportion of the money spent would have been laid out on remodelling the old structure.

As I say, provided that the would-be cottage-owner is certain as to his liking the life of the country, and of the particular part of the country in which the property he has in mind is situated, and provided that he is assured that his circumstances will permit of him continuing to live in the country, or, failing that, that he will be able profitably to dispose of his purchase by sale or letting, it is often more economical to buy a house rather than to pay rent, always assuming the premises to be carefully inspected and reported upon by a surveyor or other thoroughly competent person before the agreement to buy is signed. In the eastern counties, particularly, an old farmhouse can sometimes be obtained. In buying land as well as a farmhouse, the custom is to sell at so much an acre, the house and buildings being thrown in. In some parts of Surrey the

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land is double the price it makes in the eastern counties. Some Back-to-the-Landers who prefer to live in a community and have limited resources would perhaps do well to see what the Small Holdings Association of Newdigate, Surrey, has to offer. Land is about £25 an acre, and houses are built by the Association if required. Some cost not more than £200.

This is undoubtedly the best time of the year to look out rural properties, for they may be seen as they really are. If they are damp, they will show it. Nor is the picturesque likely to be confounded with the tumbledown. The pretty lanes giving access to the cottages will be exhibited to the townsman with all their mud and ruts, and the trees and hedges will stand forth in all their bleak nakedness. In inspecting houses, the roofs and floor-joists in particular need careful scrutiny. If these are sound—to test floors, jump on them; to find the state of roofs, look out for spots on the bedroom ceilings—the fact is undoubtedly a good point in a property's favour. The next thing is the ground floor. Is it high and dry? Then about doors and windows: are they sound, or actually worm-eaten beneath the paint? The presence of rats in a lath and plaster house is possible, and there will probably be mice. *Pulex irritans* will yield to treatment, but *cimex lectularius* is a man in possession whom it is not easy to make budge.

Other questions are: What is the soft and hard water supply? What is the soil? Has the place reasonable privacy? Is it freehold? What are exactly the rates and taxes? Are there tithes? Is labour to be got? Where can milk be got without fail? Do a sufficiency of tradesmen of the right stamp call? Where is the post office? What is the train service? If "society" is wanted, does it exist?

III. THE COST OF BUILDING A COTTAGE

All sorts of estimates may be given for building, but the man who estimates that his cottage will cost him £50 a room, not counting pantry, scullery, and closets, will really not be far out. There are plans for cottages and bungalows at £250 and £300, but the final expense is bound, I think, to exceed these figures in a number of people's cases. Of course, a cheap and comfortable enough small bungalow could be put up of corrugated iron and wood, on the lines of Mr. W. S. Blunt's forester's cottage in the New Forest, for £200; but while this might do for a week-ender or for a holiday home for the children and for week-ends, a great many would-be owners of country cottages will desire something a little more elaborate for a permanent residence.

A brick dwelling at a rigidly inclusive cost of £250 or £300 would, I am afraid, be rather bare in most cases. It ought not to be, for the rural builder can easily build a five-roomed cottage at these prices; but there are bound to be extras of one sort if not another. A man who knew something about carpentry if not building, or who had plans and specifications to go on would have a great advantage in dealing with builders. The moral is to try to profit by the experience and advice of friends who have already built themselves cottages. Above all, it is folly to delude one's self into believing that the expenditure will be kept down when there is every token that it will not. I am the last man to depreciate the value of the cheap cottages which certain firms offer; but care should be taken fully to understand exactly what is undertaken to be done.

Then there is all the expense of making the garden. No one who has not turned a bit of a field into a really good garden realises the expenditure involved, not so much in trees and flowers, &c., as in paths and labour. I have always respected the artist-architect of a week-end cottage who added to his plan a sketch of the garden—and a good house deserves the setting of a good garden—and after estimating £500 as the cost of the cottage, put down another £500 to be spent on the garden! This was, of course, ridiculously extravagant, but that artist-architect had evidently learnt by experience that fine gardens are not made for nothing.

Talking of gardens, brick wall is, of course, exceedingly expensive. It is, however, the only wall for fruit, wood being draughty; but where walls for fruit are not wanted and publicity has not to be guarded against, there are many cases in which there is much to be said for the patent-wired chestnut paling of the Economic Fencing Co., cheap, easily erected, durable (see page 71).

As to the cost of the cottage alone, let me analyse what I see one firm offers in its catalogue for £236. The first thing one notices is that the cost of the concrete foundations, the brickwork footings, the chimneys, grates, and mantelpieces, the water supply and the drains is extra. This is necessarily something substantial for a place with three bedrooms, a dining-room, a kitchen and offices. Then all carting from the station and all carting of empties back to the station is charged for. Thirdly, "the purchaser provides assistant labour if required." That is

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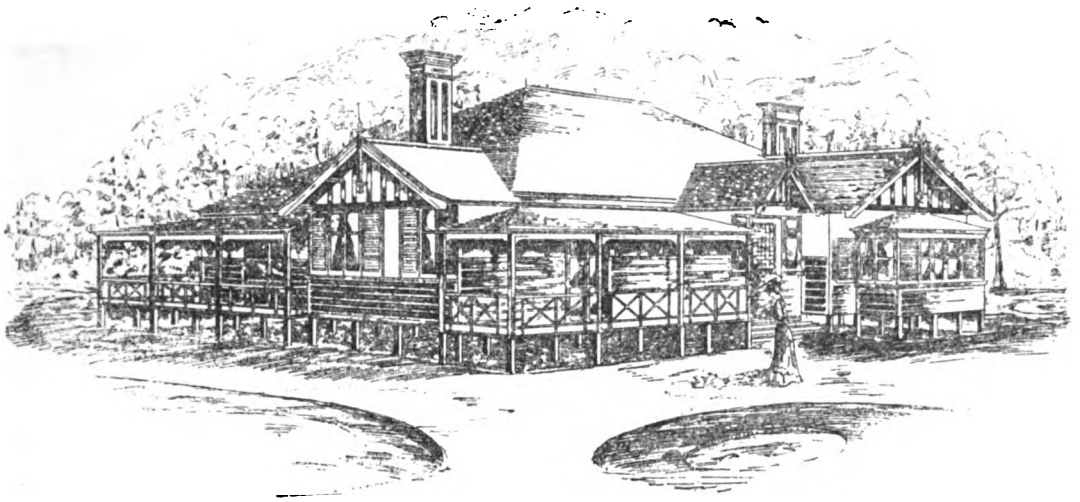


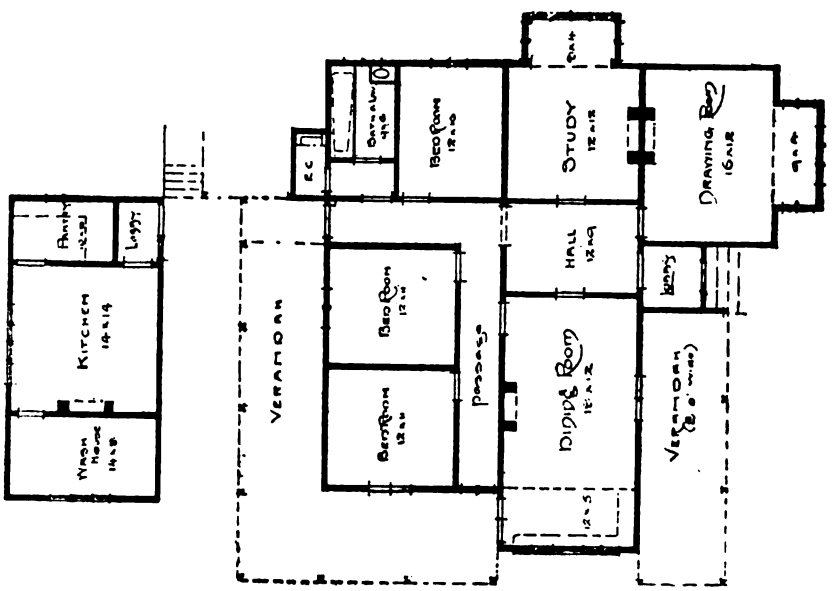
A WOODEN BUNGALOW [BROWNE AND LILLY]

£460, plus £10 for venetian shutters, £93 for tiled instead of iron roof, and cost of foundations, chimneys, fireplaces, grates, range, and bath

certainly rather vague. As to the materials of which the house is built, ceilings and walls are alike of matchboard only, oil-stained. The floors are of seven-eighths of an inch instead of inch-board. As for the roof, it is only corrugated iron, not even painted. If tiles are to be substituted, the additional charge is £48. What the total bill is likely to come to I don't know, but I observe that it has to be liquidated half on the arrival of the materials on the site, and half on completion. And, after all this considerable expenditure, what has the purchaser got? A house of only three bedrooms, a dining-hall, and a kitchen and offices—a house so arranged that one bedroom opens into the kitchen, and the other two into the only living-room, into which also every caller must enter! This is not quite my idea of a comfortable home in the country.

Every would-be cottage-owner ought certainly to submit his plans to a committee of women relatives and friends. They will soon make short work of schemes which do not show a passage or a hall, or in which the provision for privacy, ventilation, quiet, and easy and convenient working of the house is imperfect or absent.

The bungalow form of cottage has many good points. It saves the labour of going up and coming downstairs, it is more in keeping with rural conditions, its roof provides a lot of rain water, and it can be made artistic in appearance; but it should not be forgotten that it does not afford the same privacy as a two-storey dwelling, that, unless carefully planned, it may have an indifferently lighted passage, and that



PLAN OF WOODEN BUNGALOW

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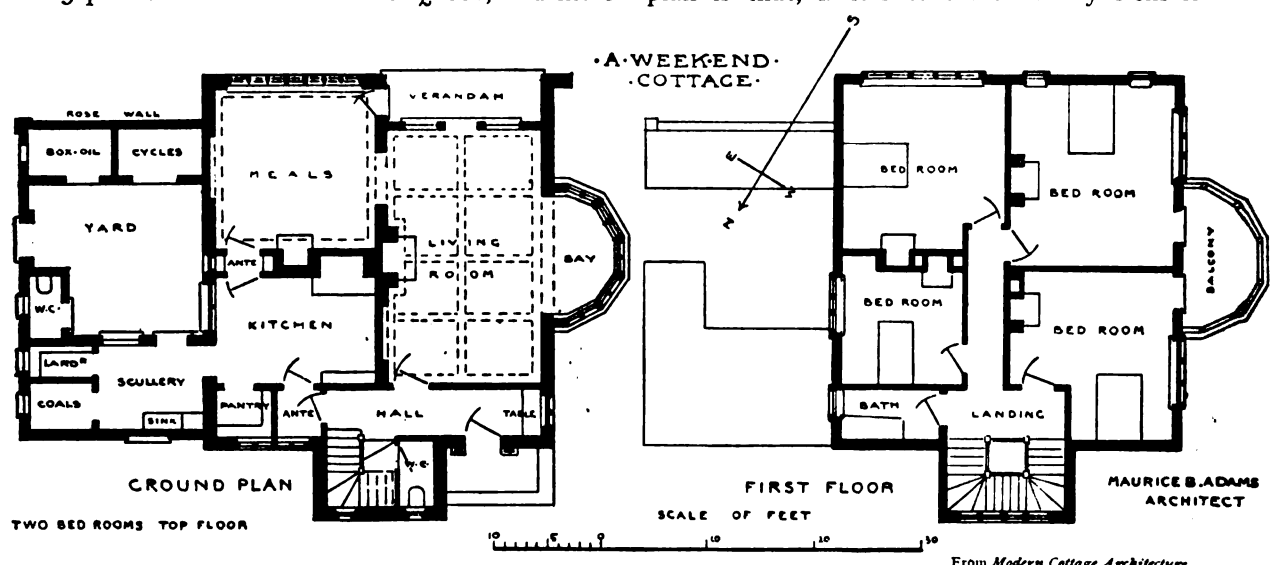
there remains in half mankind, as an inheritance, no doubt, from its supposed ancestry, a feeling in favour of going up from the ground to sleep.

IV. THE WORK OF THE ARCHITECT

In cases where the cottage is to be built and not ordered from one of the wood and iron, whole wood or concrete block firms, it is certainly desirable to employ an architect, if a copy of some one else's tested plans and specifications cannot be got. An architect's charge is five or three guineas (and expenses) for a consultation and a sketch plan. For putting a house through from start to finish, the charge is 5 per cent. if the cost is over £1000, and more



From *Modern Cottage Architecture*

A £1000 RETREAT

Note the large L-shaped family room, beautifully open to the garden. The arcnitect has shown confidence in his plan by building his own Chiswick house upon it

ordinary dwelling may run to thirty pages of typewritten foolscap. On the specification or bill of quantities—but in the case of a small house it would not be necessary to take out a bill of quantities—the rival builders are invited to estimate. A bill of quantities would cost 2½ per cent. more than the architect's 5 per cent. In a bill of quantities the exact quantities needed for the building are stated—so many cubic yards of concrete, so many squares of match-boarding, so many bricks, so many hinges, &c. This list is given to the builders willing to estimate, and they set against each item what they will supply it for. The advantage of this plan is that, if less or more of any item is

if below. For the 5 per cent., it has been stated in print that the architect has :

"(1) To prepare all necessary plans with full specification of the intended works ;

"(2) To supply the builder with copies of the same, together with any detail drawings required during the progress of the works ;

"(3) To supply the local authority with such copies of drawings and particulars of the intended works as they may require ;

"(4) To obtain tenders for the works ;

"(5) To superintend their construction, certifying for the advances to the builder ;

"(6) At completion to check the final accounts, measuring and valuing all extras, omissions, and deviations."

Mr. Wyand, who is the author of this list of duties, goes on to explain that the specification of the quality of the materials for a very wanted, there is in existence a scale of charges by which the builder who carries out the work is bound. I append, by way of illustration, a few items from a bill of quantities to which amounts would be added :

"Allow for insurance from fire to the amount of the tender.

"Provide £20 for kitchener and grates.

"Plain ridge tile, 7 in. wings, set in hair mortar and pointed with cement.

"Deal battens, 2 in. by ¾ in. spaced for Countess slating and fixed with iron nails.

"One-inch gutter boards and bearers.

"2 in. by 1½ in. herring-bone strutting to 11 in. joists, and firmly nailed."

I am glad to find Mr. Wyand saying a warning word about extras, without which it is hardly possible to do building work.

"A man with £1000 to expend upon a house and

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not wishing to go beyond this figure should never instruct his architect to prepare plans for a building to cost more than, say, £800. This, with 5 per cent. added for architect's fees and 2½ per cent. for those of the quantity surveyor, will come to £860, and the balance of £140 can very easily be utilised in meeting the bill of extras. Little matters will arise during the progress of the works entailing expense beyond that first contemplated. Tiled hearths, leaded glass in windows, artistic door furniture—there are a hundred and one items which the fancy of the owner (and his wife) will call for, and it is really surprising how quickly small sums run into three figures."

For any new works not contemplated in the bill of quantities, the builder should, of course, be asked to give a price before he executes them. It may seem at first sight rather petty to do this, but long experience has shown that estimates for extras are imperative, and builders are so accustomed to give estimates in this way that no surprise is expressed on a building owner following the usual course. I used to be rather diffident myself at asking for these small estimates, but I am sure I save money every time I do it. If a builder finds any part of the job is taking more time than he reckoned on, it is the custom of the trade to make up leeway on extras if the building owner offers the opportunity.

V. WHAT CAN BE GOT FOR £1000

In the last number of Mrs. Ernest Hart's *House Beautiful*—a publication through which a practical and carefully illustrated series of articles by a civil engineer on "Building a House" is running—the wife of Mr. Philip Miller, A.R.H.A., gives an account of how her husband and herself purchased the two adjoining cottages illustrated on page 67, and how they converted them into the extremely "desirable country house" on a small scale, a picture of which I am also permitted to reproduce.

Mrs. Miller writes: "One of our friends advised us to look for a very small house in a large garden. We searched for such through Surrey and Sussex, but had no success. Everything within our means was either too suburban or too far from a railway station." This is only too common an experience. I myself spent £20, at least, searching for a cottage in Surrey and Sussex, before I found what I wanted in another county. Mrs. Miller continues: "Buckinghamshire was recommended to us by an eminent medical man as the most healthful county in England. Hearing of an orchard, with two workmen's cottages, to be sold, on a hillside above the Valley of the Thames, and near one of its most picturesque old towns, thither we went." The cottages were duly bought. One seems to have contained five small rooms and the other four. Each cottage had a staircase of the break-neck kind with risers ten inches high and treads eight inches broad.

When they had found their cottage, Mr. and Mrs. Miller did a very sensible thing. "We decided to live in our castle for a year, to test the climate, to think over possible alterations, to listen to the advice of our friends." At the end of the year for gaining experience of the place—and of their own feelings and requirements—an architect and Mr. Miller set to work on the needed improvements.

On one side of the cottages a large, light, and lofty studio (28 ft. by 24 ft.) was built, with inglenook and gallery, and an outside porch. The kitchen-sitting-room of the probation time became the hall, and the kitchen of the other cottage the parlour.

"A new kitchen, pantry and scullery, with bedroom, bathroom, and housemaid's closet on the floor above, balance the studio wing on the other side Over one-half of the studio is another bedroom and dressing-room, the floor of which is supported by a stout oak beam, which adds to the beauty of our workshop.

"Having swept away the break-neck pair of stairs that we found in the old cottages, the question of a stairway became one of much consideration. After many plans we adopted one which gave easy steps, in anticipation of old age.

"A tiny boxroom, a large linen cupboard, and hot-air press are on our only landing. To give height to the rooms of the old cottages the floors of the ground rooms were sunk, and the ceilings of the bedrooms above raised six inches, thereby enabling my husband, who is a tall man, to go in and out with safety to his head."

Needless to say, though simplicity was the motto in the construction of the house, the owners found it difficult to impress on the workmen the fact that no mouldings or trimmings of any sort were wanted. I know from my own experience what oyster-rockery notions of ornamentation the average rural builder is wont to carry into execution if he is given the chance. The idea of liking the simplicity and beauty of the plain wood is foreign to him, and he is startled at being refused permission to set to work with paint, "graining," or at least varnish or stain.

Mrs. Miller concludes the story of the adventure as follows: "We dispossessed ourselves of all modern furniture unsuitable for a cottage

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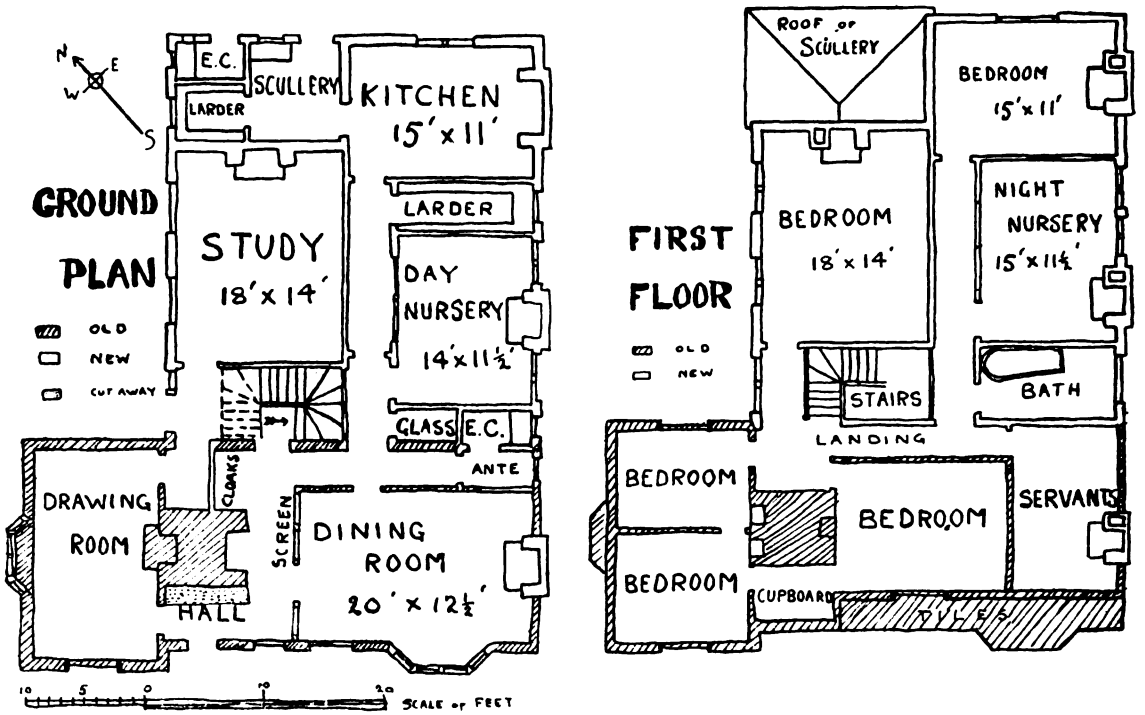

PLANS SHOWING HOW IT WAS PROPOSED TO ADD TO THE OLD COTTAGE, A PHOTOGRAPH OF WHICH APPEARS ON THE OPPOSITE PAGE

Old barn shown in the photograph is completely removed; also a kitchen occupying the site of the proposed nursery

home, and having fortunately a few family heirlooms of dainty pieces of old Sheraton furniture, we made these our principal objects. By a diligent search among bric-a-brac shops of the neighbourhood and in Ireland, we gathered together odds and ends of old wood carvings, which were used as brackets, mantelpieces, &c., as shown in the sketches of the hall and studio. We were fortunate in securing the beautiful carved balustrade of the staircase." The total cost of altering the old cottages—the purchase price of them is not stated—"adding the studio and kitchen wings, with bedrooms over, constructing the staircase, making proper sanitary arrangements, and providing water supply (inclusive of artistic tiles to the fireplaces, and some quaint old oak carvings for the doors and doorways)," was £700. In other words, probably, with the amount paid for the freehold and railway and other expenses incidental to the acquirement of the property, not far short of £1000.

This £1000 is just the amount which Mr. Maurice B. Adams, F.R.I.B.A., kindly tells me would probably be the cost of the week-end cottage illustrated by plan appearing on page 62, if "properly fitted up in a simple way appropriate to the case." I like this design very much. It is full of good ideas. Note how kitchen odours are kept from the hall by the ventilated "ante." It will be seen, too, that the staircase is out of sight of the door, and no one calling can see into the house from that point. Room for piano and wardrobes has also been thought of. The walls are faced with red brick, and red sand-faced Broseley tiles are used for the roof. The woodwork is painted white and the balcony is teak. But all the illustrations in Mr. Adams' book, *Modern Cottage Architecture* (Batsford, 10s. 6d.), are worth looking at.

VI. WEEK-END COTTAGES DESIGNED BY ARTISTS

Some time ago the *Studio* invited designs for week-end cottages, and published a large number of those sent in. The editor kindly allows us to reproduce two of them. The whole series is most interesting and valuable for the valuable hints it gives, not only as to what the bungalow or pleasure-cottage builder ought to do, but as to what he ought not to do!

For one thing, the designs show that many artists are no great architects and very poor

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R. G. Rolfe, Walthamstow

A WEEK-ENDER'S COTTAGE WHICH IT WAS PROPOSED TO IMPROVE ACCORDING TO THE PLANS ON THE OPPOSITE PAGE

builders! This is not to be wondered at, for artists are not trained in architects' or clerks of the works' offices or on buildings. That all or most of the designs were "artistic" goes without saying. Few, however, could be carried out within the stipulated cost of £500, and when carried out some of them would be truly extraordinary "houses for people to live in." One designer provides a bicycle-shed but no earth closet, another's coal house will not hold a ton, a third's bedroom walls would be barely four feet from the floor to the pitch of roof, in the sleeping-apartments of a fourth it would be impossible to get beds, a fifth's door barely scales two feet, the treads on the stairs of a sixth are not more than seven inches wide, while a seventh expects those who mount into his bedrooms to step up nine inches at a time, an eighth counts on his client getting his bath and himself into a bath-room five feet by six feet, in the case of a ninth it would be impossible under his plan to get from passage to bedroom, so low are the eaves, a tenth provides a "loggia," furnishing two feet by six feet only of room for seeking shelter from sun or rain, an eleventh makes his larder face south and gives his china closet a north aspect, and a twelfth is content with a kitchen only seven and a half feet wide.

The *Studio* correctly states that the 6*d.* per cubic foot for week-end cottages within easy reach of London, which was possible a few years ago, must now be abandoned for at least 7½*d.* per cubic foot. Possibly 4*d.* or 4½*d.* might be feasible in the wilds of the north or west—in Cumberland, Wales, or Cornwall—in cases where stone is on the site; but, as the adjudicator writes, "to mention 4*d.* or 4½*d.* per cube foot as being a fair and probable price for a half-timbered cottage, with inglenooks and other luxuries, and to expect to see your building erected in such a way as to satisfy the client who could afford to indulge himself with a week-end cottage, shows a far too sanguine disposition."

One direction in which some of the artist-designers who competed wasted money is in cutting up their roofs unnecessarily.

"Simplification of plan in such a direction as to result in a more or less square building has the advantage of that simplification of roof which makes for economy. Dormers, whether flat or pitched, necessitate both extra labour and the use of an amount of the comparatively expensive material, lead, for the valleys, flashings, and—in case of the flat dormers—roofs. A gable treatment, especially if there be two adjoining each other, means also the use of this material for the V-gutter, and the great disadvantage due to the certainty of the latter acting as a 'pocket,' which is, after a snowstorm, liable to be filled to a considerable depth."

To treat the upper floor as a Mansard or curb roof makes, of course, for economy.

The fact that many of the designs fly in the face of the average building by-laws I am not disposed to judge too harshly. In many instances it is a case of so much the worse fo the by-laws. But, in other cases, the requirements of health embodied in quite reasonable by-laws are ignored. For example, the designer who is content with ten and a half feet of super-

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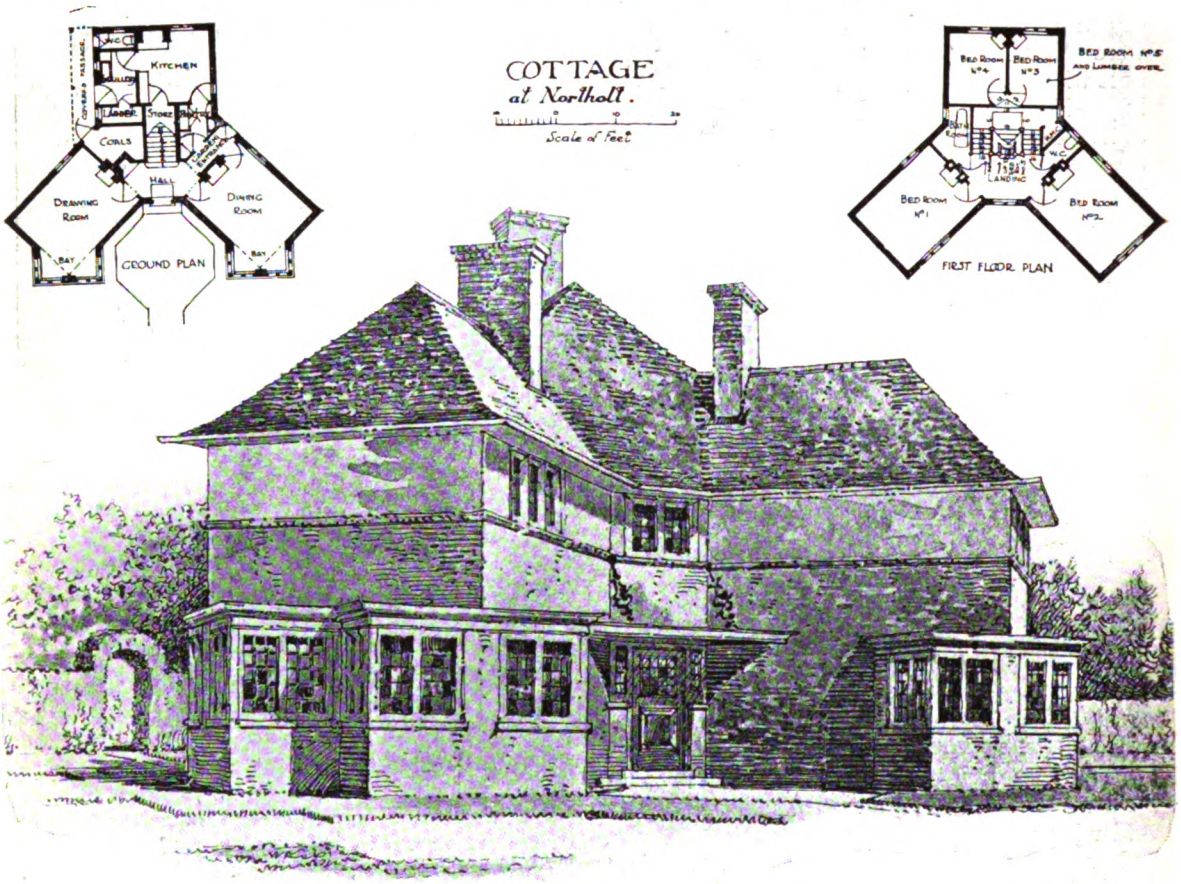
ficial glass for his "best bedroom" is decidedly in the wrong. The building law says very wisely that the proportion of glass to flooring in living-rooms shall be as one to ten. Then there is no use in contravening the regulation which provides for ceilings being of something like a reasonable height. Again, we have a drawing of an elevation which would look very different when right angles or at an obtuse angle to one another. The entering angle is made use of for the vestibule, with the hall, and occasionally the stairs, at the rear. The plan of a verandah, stoep, or loggia is also good, if large enough really to give shelter. But whether this addendum can be managed or not, a vestibule is certainly a desirable protection against wind and cold.



From *Modern Cottage Architecture* (Batsford)

A FINE BUT INEXPENSIVE DESIGN, GIVING ALL-ROUND VIEWS

Mr. Arnold Mitchell, F.R.I.B.A., architect. Red brick and tiles. Cost 8*d.* per cubic foot, measured from the bottom of footings, half-way up the house

all the rain-water pipes necessitated by chopping the gutters into short lengths were shown. By the way, I see most of the designers, when they show pipes, deliberately run the precious rain water into the ground. This is not practical country cottage-building. It might be added that in no case is more than one water-butt shown. What is one water-butt or two even for a household occupying a £500 or £700 dwelling?

A good idea worked out by several competitors was the putting of the main rooms at

The trouble with many of the competitors was, as has been hinted, that they designed on too elaborate a scale for £500. Whatever a cottage may or may not be, it is not a villa.

"The object of a week-end cottage is [as the *Studio* says] to afford a simple home, inexpensive in its first cost and in its upkeep, to which the busy man can run away from the turmoil of town, and spend as much time as possible on both sides of 'the day that comes between the Saturday and Monday.' It is a possible arrangement either to lock the place up during such days as it is not thus

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From the *House Beautiful*

THE COTTAGES WHEN MR. AND MRS. MILLER BOUGHT THEM

made use of, or to have a permanent caretaker acting as servant when needed. One or two of the competitors have planned the building for the latter system, as is suggested by their provision of a ground-floor bedroom, thus allowing this room and the adjacent kitchen to form such a caretaker's permanent quarters.

"The hall, which many of the competitors have included, if it is provided with a fireplace, serves the very useful purpose of securing the heating of the whole house during its unoccupied period. It is generally possible, even if the house be left unservanted, to arrange locally for the attending to an occasional fire.

"Few of the plans make the thoughtful, and nowadays almost essential, provision of a space, either closet or recess, near the front door in which to house a bicycle or bicycles. Only those who use a country cottage—and do so perhaps on a somewhat exiguous income—realise the necessity of this alternative to walking or the hire of the village fly—if, indeed, there be one. In arranging bicycle space, however, it is as well to remember that the machines offer the means of an easy and a lucrative theft to the country tramp, and an external bicycle house makes his booty all the easier to appropriate. The writer, for example, knows of a case in which three thirty-guinea bicycles disappeared in one night!"

Perhaps one ought to add the suggestion that in designing the bicycle shed it might as well be made large enough to accommodate a motor-car. Nothing is more awkward than to have friends come on a motor to see one in a country cottage and have nowhere on the premises where the car can be conveniently housed overnight or seen to on a wet day. In planning the motor shed, it is to be hoped that the provision of a garden-gate large enough to admit a car will not be overlooked!

VII. A DOCTOR'S EXPERIMENT

Dr. P. H. Emerson of Foxwold, Southbourne, is another builder of his own house who has lately been recounting his experiences. In a recent issue of the *Studio*, which is always having such interesting articles on country house and cottage-building, and illustrating them so effectively, he declares, like the rest of us, that he "travelled miles and miles" and "spent pounds and pounds" in search of the property to his mind, without doing much more than adding to his "knowledge of the wiles of the

From the *House Beautiful*

THE COTTAGES WHEN MR. AND MRS. MILLER HAD SPENT £700 ON THEM

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By courtesy of the *Studio*

DR. EMERSON'S BUNGALOW AT SOUTHBOURNE

Designed by G. H. Brewerton. From the south-west

sub-letting, petty landlord tribe and unscrupulous house agents." Finally, he determined to be "the fool and build."

He secured the services of Mr. G. H. Brewerton, an architect of the Baillie-Scott-Voysey school, which designs small well-proportioned houses finished in real rough-cast * and then limed. The plan and photograph on this page show the results of Mr. Brewerton's and Dr. Emerson's planning.

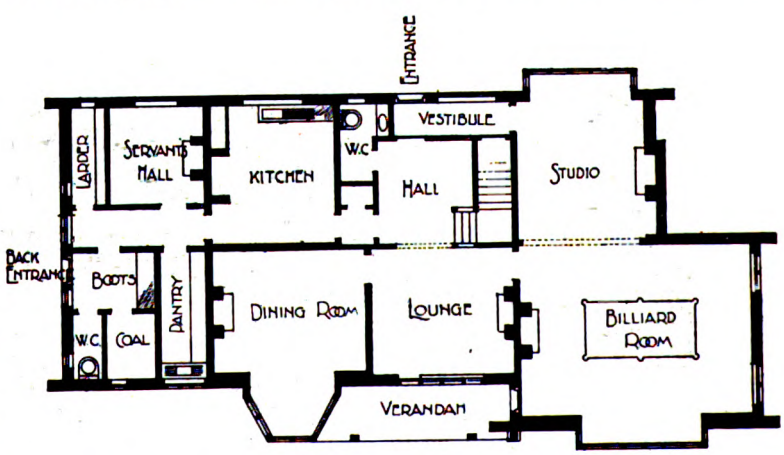
The tiles are a soft red and the rough-cast is a light buff. The wood-work was painted green with the exception of the front door, which is light blue. I summarise from the doctor's article the details of the treatment of different rooms:

Hall: Oak floor, cream-coloured walls and panelling, moss-green picture-rail and green "picking-out" of wood-work, white frieze and ceiling.

Lounge: Austrian oak floor, pink walls, light-green picture-rail, and wood-work, cream-white and moss-green; ceiling white.

Dining-room: Oak floor, Venetian red walls, dark-green wood-work and mantelpiece, light-green frieze and white ceiling.

Studio: Light stone-coloured walls, green mantelpiece, old gold tiles in fireplace, green



PLAN OF GROUND FLOOR OF DR. EMERSON'S BUNGALOW

* "Our mortar was blue lias and sand, and gravel-screenings to add the necessary sharpness, as our local sand is hardly 'sharp' enough for the purpose. The 'rough-cast' is a mixture of best cement, sand, and gravel-screenings, thrown on with a trowel. A common mistake with plasterers is that they throw it on too coarsely, and the hollows get dirty and shelter insects."

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MR. ALLPORT'S WOODEN BUNGALOW NEAR CANTERBURY

Weather board and "wire-wove" roof; wood and wire-wove walls; cost with every comfort, outhouse, water laid on upstairs, sanitation, £700

picture-rail, wood-work picked out in green, and a pitch-pine floor.

Billiard-room: Pitch-pine flooring, cream-coloured walls, crimson picture-rail, wood-work cream picked out with crimson, crimson mantel-piece, and green antique tiles to fireplace.

Staircase and upstairs passages: Pale orpiment yellow including the picture-rail and skirting boards; the doors yellow, with panels painted green. Downstairs the door panels are large slabs of Cape mahogany, the natural wood well oiled, thus showing the beautiful grain.

Bedrooms: Three are pale orpiment with the wood-work yellow, picked out with green and light-green friezes. One is white with blue wood-work, with light-green frieze. Another is pink, wood-work dark green, and frieze light green. The large window in the landing is crimson.

A WIRE-WOVE BILLIARD-ROOM UNHARMED BY FIRE, WHICH DESTROYED THE ADJOINING MANSION

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One is not surprised to learn that "the house always looks bright and cheerful on the dullest days." Yellow, of course, "gives an undoubted impression of space and perspective." All the mantelpieces—of the cheap but artistic canary-white wood—were specially made. Fireplaces and fenders are of coloured earthenware or of terra-cotta. The bedrooms have neat wrought-iron mantelpieces. All the furniture which the delightful rooms rendered necessary seems to have been designed by well-known artists, but I have no space to go into details: it is the house, not its contents, with which we are concerned at present. A great deal of trouble was also taken over the garden to provide not only the right setting for the house, but to give pleasure and health—and fruit and vegetables—to its occupants.

And how does putting one's self in the hands of artists and artist-architects answer?

"One may now take his ease [writes Dr. Emerson] in a solid, well-built, sanitary house, on the best of soils, and in the purest of air, with well-made and artistic furniture to meet the eye at every turn, and a charming little garden to delight the senses, and can ponder on the gorgeous monstrosities to be seen on every hand which the speculative builder and his tribe have erected for the scorn of the cultured; so that taste and not money is the thing, for all that I have described can be obtained by persons of comparatively limited means.

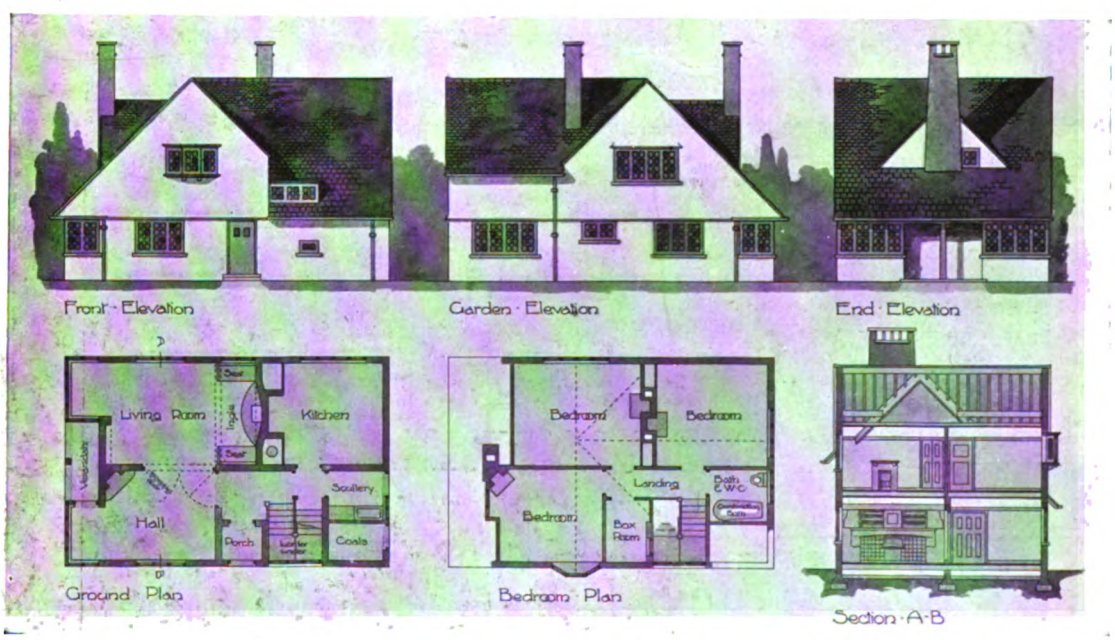
"House agents scoff, and say that nobody likes houses of this kind—that they are a bad speculation; but I could have sold or let mine a dozen times, if I had wished to, within six months of occupying it. The purblind 'business man' forgets that numberless art schools and other agencies for good have been educating the British public for some quarter of a century to appreciate the beautiful and to despise the pretentious and vulgar. An artistic and well-built house, on a good soil and in a well-chosen neighbourhood, is sure to become, in the end, a profitable investment as well as a joy to the eye and a preserver of health. Don't believe in the adage, 'Fools build houses for wise men to live in.' It is often in these days of the jerry-builder a case of 'Knaves build houses for fools to live in.'"

Dr. Emerson's advice to would-be builders may be summed up under half a dozen heads:

"(1) Never take a house without having the agreement drawn up by a *good*, honest solicitor.

"(2) Never buy a house without having it examined, reported upon, and valued by a first-rate and honest architect, for there are hordes of uneducated people *calling* themselves architects who are mere impostors.

"(3) Never build a house without finding an artistic architect, who is honest and practical as well. Avoid trusting all architectural books



Studio Competition

FIRST PRIZE DESIGN FOR A WEEK-END COTTAGE

Pronounced by the adjudicator "a thoughtful, compact, and inexpensive plan, with simple elevations, naturally treated, without disastrous affectation of picturesqueness"

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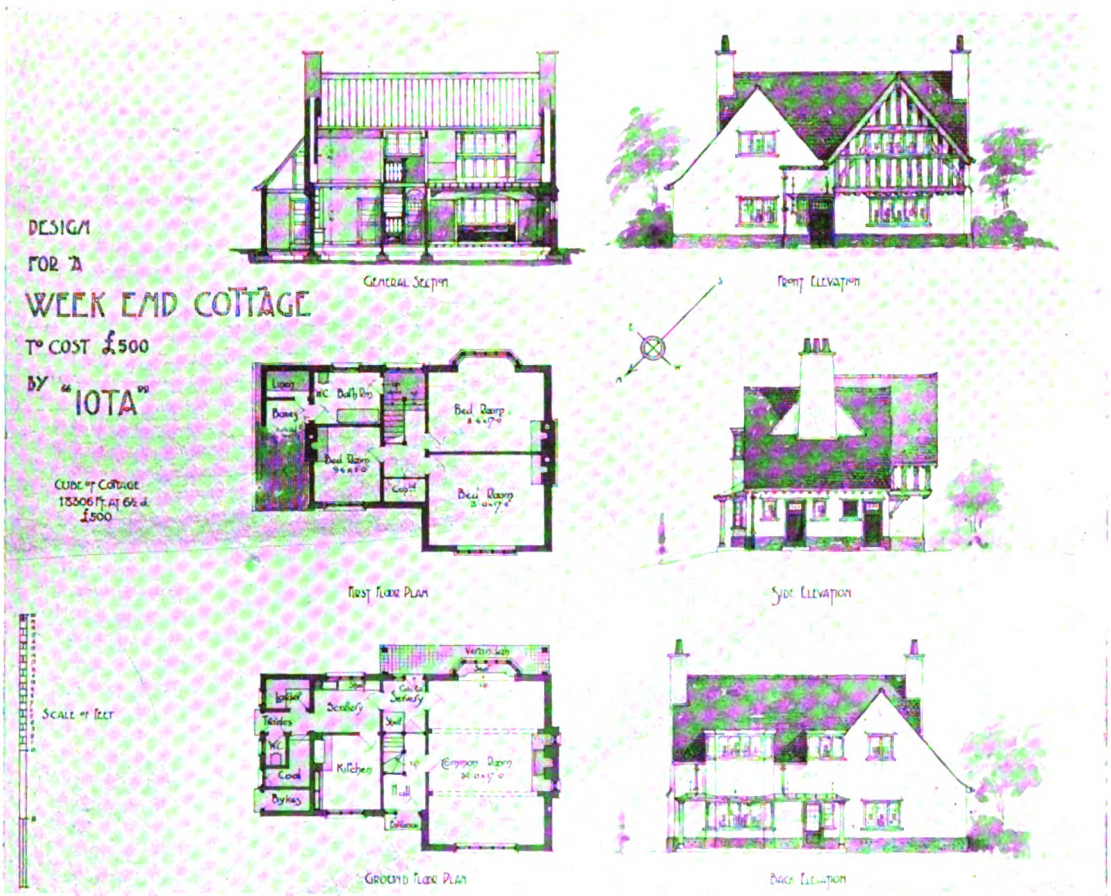

ANOTHER "STUDIO" DESIGN

Although the scullery is unnecessarily large and the kitchen too small, the large common room is an excellent feature. The adjudicator remarked very sensibly that "in a country cottage probably one of the best arrangements is that the scullery should be merely a recess out of the kitchen—perhaps separated from the latter by a flat arch, and provided with a sink and a tiled floor to carry off the spilt water after washing-up"

wherein prices are given, giving the cost of houses pictured, until your architect has given you his opinion upon them.

"(4) Always get a thoroughly qualified engineer to plan, specify, supervise, and test the drains, for sanitary science has so greatly developed that the best of architects rarely understand it. In addition, one has to be careful, because every drain-layer, plumber, and builder *calls* himself a sanitary engineer.

"(5) Always get a *consulting* electrical engineer to plan, specify, and supervise the contractors who carry this work out, for this department has become so specialised that few, if any, architects have more than a superficial acquaintance with the subject, and a disastrous fire and loss of life may be the result of trusting to wiremen, ironmongers, and electric-light contractors who *call* themselves electrical engineers The contractors of these two departments require

WIRED CHESTNUT PALE FENCING FOR A BUNGALOW

Unclimbable and rural

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as much specialised supervision as does the building contractor, and to have any but a consulting engineer for either work is as bad as having a jerry-builder for your architect.

"(6) Do not forget the servants: plan every detail, as far as is possible, for their comfort and the saving of labour."

Finally, as to cost. The builder of Foxwold does not say what his own experiment cost him exactly. He gives us this hint, however: "A house of this description costs hereabouts 7*d*. per cubic foot, reckoning the cubic contents half-way up to the roof, including extras and the architect's fees (5 per cent.). Near London, I understand, a similar house costs from 8*d*. to 9*d*. a cubic foot."

[The demands made on our space by illustrations have necessitated "Home Counties" holding over from this issue chapters on "An Expert on the Cheapest of all Bungalows," "The Case for Portable Cottages," "An Iron Bungalow for £380," "A Wooden Bungalow for £380," "A Garden City Experience," and "Hints from American Experience." In view of the interest which these Country Cottage articles have excited, this matter, with additional data of a practical character, and a series of useful plans and photographs, will compose "Home Counties'" article in our January issue entitled—"£300 and £400 Bungalows." We shall be glad to receive from any quarter interesting suggestions or experiences.—Editor, THE WORLD'S WORK AND PLAY.]

J. W. Dow, Architect, Wyoming, N.J.

A NEW JERSEY WOODEN HOUSE

Note that the gambrel roof and dormer windows are so constructed that the second storey is of ample size and well lighted

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HOW CHRISTMAS CRACKERS ARE MADE

INVENTED IN FRANCE, THE CRACKER HAS BEEN MADE POPULAR BY THE ENTERPRISE OF ENGLISH FIRMS—ARTISTIC SKILL AND INGENUITY ARE EXPENDED ON THE WORK, WHICH GOES ON CONSTANTLY FROM CHRISTMAS TO CHRISTMAS—SEVENTY-THREE ARTICLES IN A SINGLE SIXPENNY BOX

BY

PERCY COLLINS

MOST people who have given a thought to the question have concluded that the Christmas cracker, like the Christmas tree, came to us from Germany. As a matter of fact this is not the case. For the modern cracker, as well as its name, was evolved from the old French *cosaque*. The *cosaque*—meaning, literally, a sack or package containing something—came into existence about the time when men were writing '40 on their letter headings where we to-day write '04. It was simply a screwed-up piece of paper containing a sweetmeat of one kind or another. It possessed none of the artistic beauties which characterise modern crackers—its sole ornament consisting of a roughly frilled edge which had been dipped in some bright coloured dye.

But, although the cracker is French in origin, its amazing modern development as a pretty adjunct to Christmas festivities is almost wholly due to the enterprise of English firms. In the year 1847, a far-seeing man of business began to manufacture crackers in London. At that time the work was carried on in two

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or three small rooms, while the number of hands employed did not exceed forty. To-day, the well-known firm of Tom Smith and Co. occupies a huge block of fireproof buildings consisting of eighteen floors, and employs several hundreds of hands. Moreover, other firms, both in London and the provinces, vie with one another for a share in the growing demand for crackers which each succeeding Christmas brings.

Cracker-making to-day is anything but a simple undertaking, nor is it confined to any particular season of the year. "We reopen our works immediately after the Christmas holidays," said Mr. Walter Smith, the managing partner of the firm, "and shall go on steadily working upon our next year's output until Christmas Eve of 1905; and it will take us all our time to get our supply in readiness."

The work involves an immense amount of labour never dreamt of by the public in general. A visitor to the factory is shown huge machines designed for box-making, lithographic printing, the cutting and shaping of card, paper, and gelatine, all of which bear a necessary part in the manufacture of Christmas crackers. The "make up" of a single sixpenny box of crackers includes the box and its gay label, twelve wrappers of pretty fancy paper, twelve ornaments, coloured scraps or pictures, twelve pieces of white paper beneath the fancy coverings known technically as "linings," twelve surprise articles, twelve mottoes, and twelve "snaps" or detonators—making a grand total of seventy-three. Of course the more costly boxes include a still larger number of items.

The tons of cardboard, paper, coloured gelatine, and other materials pass through many processes in preparation for the act of cracker-making proper. A score or more of ingenious mechanisms conduce to this end. As an example, the wonderful frilling machines may be cited. They are used for frilling the ends of the paper which is to be made into crackers, and their teeth—like a fine comb—are capable of cutting through many thicknesses at one time.

But the casual visitor to a cracker factory finds most to interest him in the final or making-up process. This is accomplished by girls; and the necessary speed and deftness are by no means easy to acquire. As a rule, it is found that a girl does not become a really first-rate hand until she has been at the work for two or three successive seasons.

FLORAL CRACKERS FOR TABLE DECORATIONS

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The girls in the cracker-making department sit on stools at a long bench divided into numerous sections—one for each worker. Each girl is supplied with a store of the papers and contents necessary to the special kind of cracker she is to make, a glue pot, and certain implements consisting of a short hollow cylinder, a metal block and a piece of waxed string.

In making a cracker the girl first spreads upon the bench the showy external covering, together with the white lining sheet and the ornamental borders. The "snap" or detonator is then laid centre-wise upon the paper, and the whole is rolled quickly round the hollow cylinder—the cylindrical block being placed at one end inside the paper. If these operations have been performed "to gauge," the juncture of the cylinder with the block gives the place for constricting the cracker at that end. This is done by means of the waxed string. The motto and the surprise souvenir—be it tightly rolled cap, jewel, or toy—are dropped in, and the hollow cylinder is withdrawn. The metal block is now inserted at the other end, which is constricted in its turn, by means of the string. Finally, the outer ornamentation is gummed on, and the complete cracker is set aside to await its journey to the packing-department.

That these operations are performed with almost lightning-like rapidity will be appreciated from the fact that a skilled hand will easily turn out from four to five gross of crackers per day.

The contents of each cracker is, nowadays, a matter for serious consideration. Thirty years ago, the public were well satisfied with the orthodox sugar-plum or burnt almond. But the demand for novelty grows apace, and crackers—like all else—must be up-to-date. At the present day, all parts of the earth are scoured for the little souvenirs which are to be the cause of jollity and laughter in thousands of homes at Christmastide. For instance, there is a regular trade with China and Japan for the supply of numberless little articles such as tiny native dolls, fans, vases, and figures. Bohemia, too, sends to England a large and regular supply of nicknacks destined to become the contents of Christmas crackers. Of trinkets and charms, those which are this year being wrapped in their bonbons by Caley and Son of Norwich, are especially praiseworthy. They comprise scores of unique designs beautifully executed in hard white metal.

FRINGING THE ENDS OF PAPER FOR CRACKERS

This is done by the machine the girl is working. It has teeth like a fine comb, capable of cutting through many thicknesses at one time

"WHAT HAVE YOU GOT?"

Some of the charms and trinkets that are put into crackers

To gain an idea of the immense stock of articles adapted to every conceivable taste which the cracker-maker must stock, it is only necessary to glance into his store-room whence the workers draw their supplies. We find ourselves in a veritable curiosity shop. Rings and pins, necklaces and chains, brooches and lockets—all are here in almost endless variety. Then there are magic flowers, fly cages, pawn tickets, marriage certificates, air balloons, tops, tee-totums, puzzles, pictures—together with a thousand and one other articles resembling one another only in this particular, namely, that they are all of a size suitable for rolling up in a cracker.

It has been said that many of these odds and ends are brought from abroad. The paper hats and caps, on the contrary, are all made on the premises. The coloured tissue paper is

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MODELLING PAPER HATS TO GO IN CHRISTMAS CRACKERS

cut into shapes by machinery—hundreds of sheets at a time. These shapes are then fitted together and modelled upon blocks, when the necessary ornaments are added. Then, after a brief period of drying, the hats and caps are folded into the smallest possible compass.

Mottoes, too, are homemade, and it is whispered that certain of our minor poets do not scruple to take advantage of this outlet for versifying. Some of the mottoes are exceedingly smart and to the point. This one, for example, found in a "Press Cracker" is worth quoting.

How many "Times" must I "Express"
How dear thou art to me—
A "Mail" whose "Standard" happiness
Is "Daily News" of thee?
What "Sporting Times" of love and glee
My "Outlook" would relate,
If you would only let me be
"The Guardian" of your fate.

The most notable advance traceable in the history of the Christmas cracker lies in the artistic skill and ingenuity displayed in its inception and manufacture. The designs, both for the boxes and for the covers of the crackers themselves, are most carefully thought out, in order that the effect of the whole may suggest and be in keeping with the central "idea" of the production. The ideas vary greatly, of course, and complete novelty is in perennial demand. Public thought and taste, however, as shaped by notable events, discoveries, or inventions, are carefully studied. Thus we have the "Marconi Message Crackers," "Motoring Crackers," "Leap Year Crackers," "Submarine Crackers," "John Bull's Store Crackers," and quite a number of crackers specially designed to meet the present taste of the British public for anything and everything connected with Japan and the Japanese. In all these instances, boxes, crackers, mottoes, and contents have been carefully planned to bear upon the central idea which they suggest.

Modern crackers are by no means invariably the well-known cylindrical objects which we are accustomed to associate with the name. A glance at the accompanying photographs

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will give the reader some idea of the forms, weird and beautiful, taken by some of the latest novelties. Some of the special table decoration *cosaques* which have recently been placed upon the market are really works of art, and the prices asked and paid for the more elaborate varieties are little short of amazing to those who have been accustomed to think of crackers merely as a means of providing a delightful hour at a children's party. It must be remembered, however, that when paying half-a-guinea or so for a box of six *cosaques*, the purchaser receives a good deal more than a mere snap and surprise rolled in prettily coloured paper. Many of the table decoration crackers produced by such a firm as Messrs. Caley are ornamental in the highest degree, and are surmounted by a spray of exquisitely modelled flowers and foliage. It is, moreover, a noteworthy fact that the whole of the embellishments used by this firm are manufactured at their Norwich works.

Another notable feature in connection with Messrs. Caley's output is seen in the high art labels on their boxes. These are the work of artists who are, year by year, making their names at the Royal Academy. The designs are printed in two or three colours and are of great breadth and strength. Many of them are exceedingly striking.

MAKING THE SMALLEST CRACKERS IN THE WORLD

They are three inches long, and appropriately named "Tom Thumb"

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A PICTURE CAKE, REPRESENTING AN ATTACK BY INDIANS ON A SETTLER'S CABIN

ARTISTIC SWEETMEATS FOR THE HOLIDAYS

ARTISTS IN SUGAR—A VISIT TO A SWEETMEAT FACTORY—THE SECRET OF CANDY—EASTER EGGS AND WALNUTS

BY

B. J. HYDE

Illustrated from photographs chiefly by CLARKE AND HYDE

FEW people who have not had the privilege of being conducted over one of our great modern sweet factories have any idea of the skill and artistic ability that are essential for the production of up-to-date sweetmeats.

The old-fashioned "lolly pop" has had its day, and in its stead the public demands confections that must be attractive both to eye and palate. Producers have risen to the occasion, and to meet the demand have fostered and encouraged originality in design and execution among their employees, till many of the more expert workers may conscientiously lay claim to have become veritable artists in sugar.

To a large extent the pioneers of these artistic

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MOULDING THE EASTER EGGS AT FULLER'S

THE ART OF UNSHELLING WALNUTS IS TO KEEP THE HALVES INTACT

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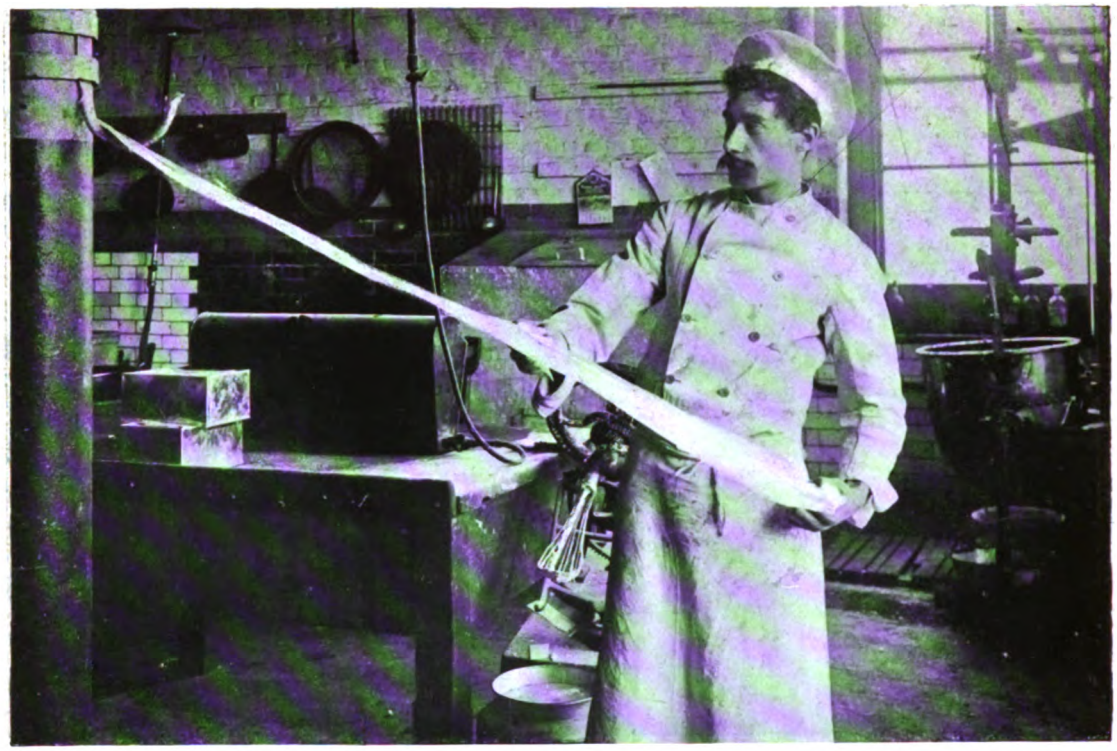
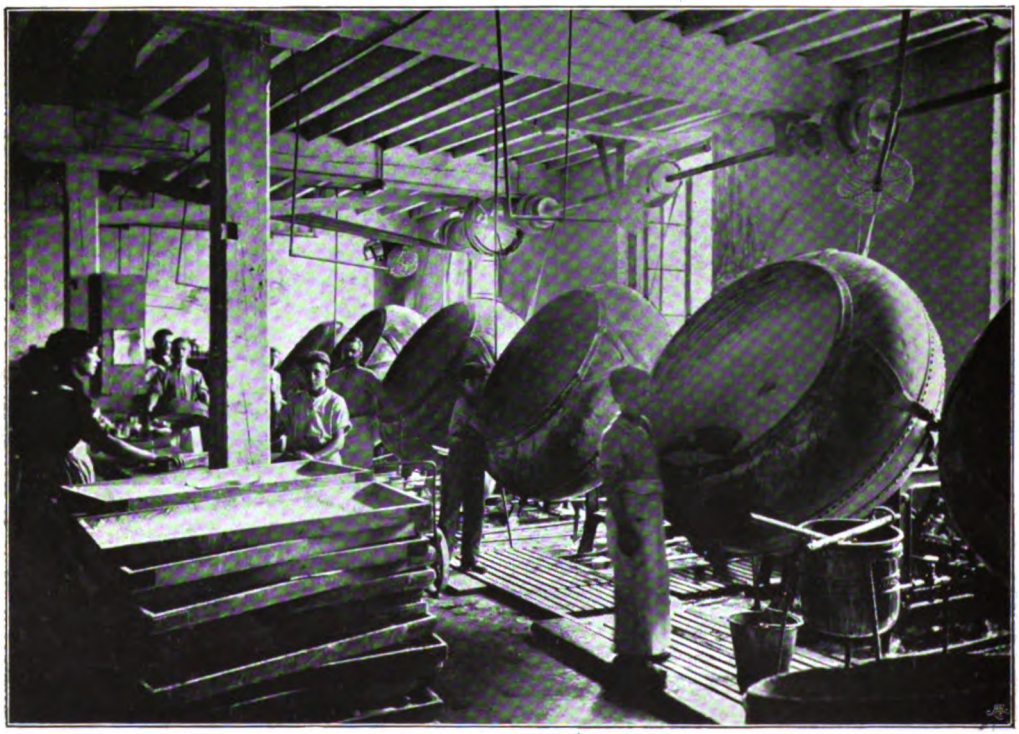


AN EXPERT DRAWING CANDY



THE PAN-COMFIT ROOM AT MESSRS. CLARKE, NICKOLLS AND COOMBS'

This firm has at Hackney Wick, in north-east London, one of the largest confectionery works in the world. They employ about 2300 workpeople chiefly females

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confections in this country were the well-known American firm of Fuller's, whose beautifully draped retail departments have, of late years, become so familiar to the frequenters of our principal thoroughfares. A visit to the magnificent factory of this firm at Hammersmith is replete with surprises for the uninitiated, for every process, from the converting of raw materials into toothsome delicacies even to the manufacture and packing of the boxes in which they are contained, is carried out under one roof.

On the ground floor is a series of interesting machines devoted to the production of chocolate. The first of these is the Husker. Into the hopper of this ingenious piece of mechanism the freshly roasted cocoa beans are shovelled. The machine then removes and rejects the husks and partially grinds and sifts the kernels, the different grades each falling into a separate receptacle. At this stage the product is still dry and crisp. It is next placed in the crushing mill, and the two ponderous steel rollers revolving in their circular trough crush the oily substance out of the beans and work the entire mass into a semi-liquid condition. When this operation has been successfully accomplished the cocoa is poured off into pans and taken to the press, and there subjected to a pressure of nine tons.

The press is constructed on similar lines to a chest of drawers, to hold six of the pans, any of which can be withdrawn independently, and the contents removed if desired. The effect of the pressure is to force out the cocoa butter, which is drained off into a vessel at the base, leaving the cocoa once more dry, moulded, and solidified into a cake.

It is upon the quantity of cocoa butter withdrawn that the future quality of the chocolate depends. Incidentally the "cocoa butter" is of more value commercially than the cocoa.

The cake is again ground and mixed with sugar, and then put through a curious machine having two massive rollers like a gigantic mangle, between which the mixture is passed in order to ensure that the sugar is properly mixed, and to eliminate any gritty substance that may have escaped the previous grindings. During this process the substance again becomes moist and of a soft doughy consistency. On leaving this machine its preparation as chocolate is complete, and it is handed over to other departments to be worked into the various patterns of plain chocolates, or to be used in the production of what may be termed compound sweets.

The fancy designs in plain chocolate drops are not, as is generally supposed, moulded, but each one is made separately by hand. The worker first makes an ordinary conical sugar bag of white paper; the tip is then torn off, and a small metal funnel is inserted. Having filled the bag with moist chocolate and folded the top, a slight pressure with the right hand forces out a thin stream of the soft material, which is guided by the deft fingers of the left to form any required pattern, and their variety is endless.

This is done on sheets of pasteboard covered with tinfoil and stamped all over with the name of the firm in raised letters, so close together that it is impossible to make a sweet anywhere on the sheet without the moist chocolate retaining at least one complete impression of the maker's name. As each sheet is covered with confections it is carefully placed on one side to allow the sweets to set before being removed in trays to the packing-room. So expert do the operators become at this work that a first-class hand can turn out forty pounds per day.

Another interesting item is the manufacture of parti-coloured candy. The material for this is nothing more or less than pure sugar and water, with the addition of colouring-matter, if required. The secret of the transformation lies in the method of working it up. First the pure sugar and water are boiled together till the required consistency is obtained. It is then poured out on to white marble-topped tables to cool, and has the appearance of clear glass.

When sufficiently cool a large square is cut off with a knife, and rolled up and kneaded into a solid lump. Liquid colouring matter is next added if required, and the process of kneading continued until the whole attains a uniform tint. When first added the streaks of colour running through the clear sugar give some very pretty effects to the mass. If colouring-matter is not added the process of kneading turns the candy to a milky white.

It is necessary for this operation to be performed expeditiously, otherwise the candy would cool, and become too set for drawing. To draw forty pounds of candy requires a strong arm, a steady hand, and a quick eye. Close beside the table will be found a pillar to which a strong iron hook has been clamped. Over this hook the man who draws the candy throws the lump. Catching the candy in his hands as it sags he retreats some two or three yards, drawing the candy into a long string as he does so. Just as one expects to see the end fall from the hook on to the floor, with a quick and skilful movement the man advances and, with a turn of his wrist, loops the centre of the candy

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back on to the hook, and again retreats, repeating this until the candy has been sufficiently drawn.

The object of drawing candy is to fill the sugar with elongated air bubbles and render it light and porous. The drawing must not occupy more than from a minute to a minute and a half, as the candy soon gets too stiff to work when exposed in the cool air.

Having been drawn the lump is ready to be worked into the various forms in which it is purveyed to the public.

On the right of our illustration will be seen the copper vessel in which the candy was boiled, and in the centre the finishing-table. This table is fitted with a row of gas-jets enclosed in a tin shield, in front of which the candy is deposited after having been drawn. This shield is so arranged as to throw the heat down on to the table, and so keep the candy pliant while being worked.

The parti-coloured bows, &c., are made by drawing a strip of coloured candy from the lump on to a white strip in front of this appliance; the strips immediately weld themselves together, and can be worked as one piece. As these thin drawn strips set in a few seconds, designs of large size must be made in small portions, and fitted piece by piece to the main design, to which they adhere firmly as the candy sets.

n the moulding of Easter eggs the liberal use of powdered white sugar necessitates the hair being kept covered with tightly wrapped linen bandages. On the left of the picture a girl is seen carefully binding the two halves of the moulds together before being filled, while another is employed constantly stirring the material in a large copper vessel. Many of the larger of these eggs are most artistically decorated. The flower ornaments are made separately and stuck on with moist sugar; the writing and more delicate portions of the design are traced in the same manner already described in the manufacture of chocolate drops.

Walnuts figure very prominently in, or rather on, many varieties of sweetmeat, but to be of service it is imperative that the nut should be extracted with the halves intact. Should a nut be broken the fractured portions are placed in a special tin, and can only be used for flavouring purposes. Seated at a long table with a large quantity of nuts heaped in front of them, each armed with a hammer, with deft fingers the young women select a nut, and holding it upright between finger and thumb, deliver two smart taps, one at each end, a little to one side of the line that makes the division of the halves of the shell, thus enabling the kernel to be withdrawn whole. The walnut crackers are remarkably expert, and considering the rapidity with which they work the resulting pile of damaged kernels is exceedingly small.

From the cake room some highly ornamental and artistic creations are turned out. The method of decorating these is similar to that employed on the Easter eggs.

To tell a man to produce a coloured relief picture with a paper bag and some soft sugar, sounds rather like commanding "bricks to be made without straw." However, I was shown some truly marvellous results produced by Mr. Hilderbrand. The colouring of these remarkable pictures is excellent, and the effect wonderfully realistic. The foundations and frames are of cardboard. One of the largest and most elaborate designs is the representation of an attack upon a settler's log cabin by mounted Indians, shown on page 78. It measures two feet six by eighteen inches.

It is wonderfully delicate work, for each little figure has to be made individually and inserted after the background has been completed, and a dab from the sugar bag in the wrong place would irretrievably ruin the entire construction.

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THE FOURTH ESTATE IN AFRICA

BY

LEO WEINTHAL

MANAGING DIRECTOR OF THE "AFRICAN WORLD," LONDON

JUST on four years ago I did what is called the "Round Africa" tour by the German East African steamship line, sighting Egypt near Alexandria and spending a day at Port Said, subsequently passing through the Canal, Red Sea, and speeding southward along the East Coast *via* Zanzibar and Natal, to the metropolis of Cape Colony, nestling so picturesquely under the shadow of grim old Table Mountain. Passing into the Atlantic we again turned our eyes towards Europe, which was reached in three weeks *via* the West Coast ports and Canary Islands. I think no better idea could be given of contemporary African Press developments than by asking my readers to take an imaginary trip around the Continent, in the course of which I shall endeavour to give a reflex of the great recent expansion of journalism in the vast regions stretching from the Nile to the Cape of Good Hope and from the estuary of the Congo to the coral island of Mombasa, the port base for the famous Uganda Hinterland, and the still unexplored equatorial Alpine glories of the vast Ruwenzori Ranges.

EGYPT AND THE SUDAN

Let us take a glimpse at newspaperdom in the land of the Khedive. The Press of Egypt, numbering over sixty journals, is published in the French, Arabic, Coptic and English languages—with a couple of them issued in Greek and Italian. The leading British organ is the *Egyptian Gazette*, published as a daily at Alexandria, far and away the smartest publication in the country. It is very ably edited by Mr. Rowland Snelling, and is evidently on terms of friendly intimacy with the powers that be at the British Embassy. Quite recently the *Egyptian Morning News*, a daily English edition of the influential French journal *L'Egypte*, has made its appearance at Cairo under the guidance of Mr. Bernie Mansfield, an old resident on the banks of the Nile. The only other English publication is the weekly *Sphynx*, which makes somewhat irregular appearances during the tourists' season. The leading French journals in Egypt include *Le Phare d'Alexandrie*, *La Réforme*, *La Verité*, *L'Egypte*, *Le Journal Egyptien*, *Le Progrès*, *Le Journal du Caire*, *Les Pyramids*, *La Bourse Egyptien*, *Le Phare de Port Said*. Of the Italian journals, only *Il Corriere Egeziano* and the Port Said *Telegrafo* come into serious consideration, and the Greek Press is represented by the *Tachydromos* at Alexandria, but little can be said in praise of these either for editorial conduct or general appearance.

The vernacular press of Egypt, printed in Arabic, Turkish and Coptic, is powerful in its way, and under such gifted leaders as the "Sheik Ali Jusef," who is reputed to be in close touch with Stamboul, produces such smart journals as the *Al-Moyad* and *Al-Mokattam*. There are other influential papers such as the *Misr*, *Aaram*, each with a great circulation, the *El-Afkar*, *Al-Watan*, *Arraied-ul-Misri*, *Al-Nossawar*, and the *Egyptian Mail* (a daily Arabic paper). Exclusive of native and Arabic journals, Alexandria has no fewer than *ten* dailies and one weekly publication, whilst Cairo, with nearly twice as many inhabitants (rapidly approaching towards half a million), can boast of nine dailies, of which, as in Alexandria, only one is printed in English, and that one more or less only as a subsidiary page to an important French journal.

Khartoum, only eight years ago the centre of a barbaric Mahdi's empire, and the ever remembered scene of General Gordon's tragedy,

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has a daily journal named the *Sudan Times*, published in Arabic, and a *Government Gazette* issued by the Administration. Coming to French Somaliland, where at Djiboutil *Le Djibouti* was issued till quite recently, we find the *Journal Officiel de la Somalis de Côte Françaises*—an official issue only.

We pass the Straits of Babel-Mandeb, peep into newspaperless Aden, which is nevertheless a very live-wire junction for cable news from everywhere, and presently double Cape Guardafui, the eastern extremity of Africa's still unknown horn, the home of mad mullahs and other methodical lunatics.

East Africa

The next port of call is Mombasa, joined to the mainland by the Salisbury railway bridge. A weekly journal, owned by a wealthy Indian merchant and Government contractor, is published here, called the *African Standard*, exceptionally well got up and neatly printed, though often conducted editorially on personal lines which would not be tolerated in Europe. The *East African and Uganda Mail* was issued weekly at Mombasa until quite recently, and was the oldest journal on the Coast. Its editor is a lady—Mrs. Olive Grey—whose spare moments from editorial duties are devoted to producing locally popular literature and feeding her lion cubs. Nairobi, the capital of the Colony, boasts of the excellently compiled *British East African Quarterly*, but is served for daily news by the Mombasa journals.

German East Africa's sole press venture is the *Deutsche Ost Afrikanische Zeitung*, an excellently edited and most interestingly compiled journal, which includes the official Gazette notices, and covers, as a field of business, Dar-es-Salaam, Bagamoyo, Pangani, from the coast to the Victoria Nyanza and Kilimadjaro to Ujiji on the Tanganyika and the north-eastern shores of Nyasa, to all of which distant regions its energetic editor, Herr von Horn, pays frequent visits of inspection.

Amongst the chief East African Islands, we have Zanzibar, with the *Zanzibar Gazette*, published in English, Arabic, Indian and Suaheli; Madagascar, with an excellent weekly *L'Echo*, published at Antananarivo, *La Cloche*, *Le Madagaskar*, issued in French, and the *Frantsai-Malagascy* and *Vao-Vao*, issued in the vernacular; and *La Depêche de Madagascar* at Tamatave. Mauritius has ten dailies, amongst which the *Merchant and Planters' Gazette* and the *Vrai Mauricien* are the most influential, and a dozen weeklies, circulating amongst the Creole population with the monthly *Revue Agricole*; whilst at Reunion the weekly *Nouveau Salazien* is published at St. Denis, with an official *Journal* at the Seychelles.

We turn again to the mainland. Portuguese East Africa possesses the weekly *Africano Oriental* and *Bulletin Officiel* at Mozambique, the *Africano* at Quilimane, and two smartly edited English journals—the *Beira Post* at the eastern port of the Rhodesian Railways system, and *O Futuro* at Lorenco Marques, Delagoa Bay, both of which are partly printed in Portuguese. Another Portuguese journal, *O'Progresso*, is likewise issued at the eastern port just mentioned. Quite a unique feature of Delagoa journalism is the special profession of "Prison Editor," a gentleman in receipt of an equitable fixed salary, who must, however, be prepared to serve a term of penal servitude at a moment's notice on behalf of the real Editor, owing to the peculiar exigencies of Portuguese colonial Press and libel laws.

Central Africa and Rhodesia

The Hinterland of Portuguese East Africa is the Zambesi valley, and what is known as British Central Africa. At Blantyre Mr. Harold Rutherfoord edits the excellent *British Central African Times*, whose frequent sad obituary paragraphs demonstrate the climatic dangers rampant for British workers in Central Africa both in commerce, plantations and the mission field. The *British Central African Gazette* at Zomba, and *Life and Work*, an interesting mission journal composed and printed by native converts and published under the auspices of the Scottish Church mission, are typical issues of the rising young Protectorate.

And now we come to Cecil Rhodes's land, which has a representative and well-conducted Press, composed of the *Buluwayo Chronicle*, the *Buluwayo Express*, the *Gwelo Times*, the *Rhodesian Herald*, and *Rhodesian Times* at Salisbury, with the *Advertiser* at Umtali—not forgetting the neat *Northern Rhodesian Government Gazette* issued at Port Jameson near Lake Nyasa. The field is well filled, and considering what unexpected and uncontrollable reverses the young country has passed through during the first decade of its existence, the smart appearance and the enterprise of all these journals are most remarkable.

South Africa

From the Victoria Falls to the Limpopo and the Vaal is but a short jaunt in our mental journey, and as there are over a hundred newspapers of various shapes, sizes, creeds and

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tongues south of the Zambesi, it would be impossible to give within the limits of this short survey a description of each, but by touching on the history of the principal journals of each political and social group in British South Africa, I hope to convey a fairly adequate idea of the status and ambitions of the South African newspaper press. First place must undoubtedly be given to the *Cape Times*, with which the name of St. Leger is as inseparably associated as is that of Walter with the London *Times*. The *Cape Times* occupies, relatively to its environment, a similar privileged position, speaks with a similar decisive authority, and displays a similar excellence in the matter of its news supply. Founded fifty years ago by the late Frederick York St. Leger, a scholarly writer and gifted man, in partnership with the veteran journalist, R. W. Murray, sen., the Nestor of the South African Press, the *Cape Times* has steadily progressed to its present position of eminence. The brilliant work and respected personality of St. Leger the elder first made the paper's fortunes, and the business acumen of St. Leger the son has placed those fortunes on an unassailable commercial basis. After the elder St. Leger, the man whose work most enhanced the reputation of the *Cape Times* was Mr. Edmund Garrett. His editorship and a great career in politics were—alas!—cut short by a complete physical breakdown. The paper's destinies are at present directed by Mr. Maitland Park, an Anglo-Indian journalist, with a reputation worth maintaining, an acute judge of men and matters. Side by side with the St. Legers must be placed the Hon. Edmund Powell, M.L.C., the veteran editor of the *Cape Argus*, which was started in the early days by Mr. Saul Solomon as a morning, but was subsequently converted into an afternoon paper of several editions. Mr. Powell has for many years been the London *Times* correspondent at the Cape, and is one of the oldest and most respected of South African journalists—a hard fighter in politics, but at the same time generous, courtly, and kind to a degree.

Of an entirely different political complexion from either of these, but no less cleverly conducted, is the *South African News*, the organ of the South African party. Founded in 1898 the *News* has been chiefly conspicuous for its consistent opposition to the Imperialism of which Lord Milner is the embodiment, and for its championship of Dutch interests, national and otherwise. Deservedly or undeservedly, the *News* was suspended for months during the war by order of the military authorities, and its editor, Mr. Albert Cartwright, sent to gaol for a year, which he utilised by emerging from his cell a perfect Dutch linguist. Professor Fremantle, son of the Dean of Ripon, is now allied with Mr. Cartwright in the editorship of the *News*, which, comparatively young though it is, has become an undeniable power in the land.

Holding the balance between the various political and social factions, and an unsparing critic of all, is the weekly *Owl*, twin brother to the famous *Sydney Bulletin*. The puissant pen of its editor-proprietor, Mr G. H. Kingswell, coupled with exceptionally clever cartoons by Mrs. "Scalpel" Penstone and Mr. Egersdorfer, has in three years placed it on an exalted pedestal, from which it deals out caustic judgment with sublime indifference to the feelings of its victims. Of a similar temper and brightness is the *South African Review*, another weekly censor of the public and private morals of Capetown. To an entirely different category from these, linguistically, socially, and politically, belongs the famous Dutch daily organ *Ons Land*. Originally founded and long controlled by Mr. Jan Hofmeyr (Onze Jan), the father of the Afrikander Bond, it exercises an incalculable influence over the South African Dutch electorate—an influence—I might remark—which is quite unappreciated in England. It is now edited by Advocate Malan, M.L.A., a shrewd and able politician, who, still young, bids fair to become very soon the leader of the Afrikander party in Cape Colony.

Amongst other Capetown publications that deserve mention are the *Veld*, an elegantly illustrated and well written monthly; and the official *Agricultural Journal*, which maintains a very high standard of excellence. Moving eastwards along the coast we find in busy Port Elizabeth, the Liverpool of South Africa, go-ahead specimens of Cape provincial journalism in the *Eastern Province Herald*, the *Port Elizabeth Advertiser* and the *Cape Daily Telegraph*. The former is owned and edited by the Hon. E. H. Walton, at present the Treasurer of the Colonial Cabinet. The latter two are prosperous properties, owned respectively by Mr. T. A. Brewster and the Kemsley family. At East London, called the fighting port, because of its energetic competition with Port Elizabeth for the up-country trade, is the *East London Dispatch*, one of the smartest dailies in South Africa, enterprising and go-ahead as the town to which it belongs. On the frontier, at Kingwilliamstown, the *Cape Mercury*, and at Queenstown the *Queenstown Representative*, minister to the wants of British Kaffraria. Driving

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through Kaffirland proper towards the midlands, we reach the capital of Grahamstown. Here are published *Grocott's Penny Mail* and the *Journal*, both of them excellent journalistic products. Like the *Midland News* in Cradock, they belong to the Conservative and early Colonial school, with old-fashioned healthy ideas, which do not always square with the more modern conception of things cherished by new chums, who would like to transform South Africa in a day. The Imperial idea is kept alive in the Dutch midland districts by the *Graaff Reinett Advertiser*, the Bond ideal by the *Graaff Reinetter*, both of them a credit to the "gem" city of the central Colony. Ranking quite with the big dailies of Capetown is the *Diamond Fields Advertiser*, the admitted official organ of the De Beers Consolidated Mines, and admirably conducted by Mr. George Green, who has been its editor for the last six years. Before leaving Cape Colony, mention must be made of several native newspapers which are fast becoming a factor in the land, and, I fear, not always a factor for good. In Kingwilliamstown is the most important of these, *Imvo* (*Native Opinion*), edited by Tengo Jabavu, an educated Kafir leader, whose political sympathies are on the side of the Bond, while the progressive or anti-Bond negroes were during the recent elections represented by a rival journal of Imperial tendencies. Alongside of the small British weekly *Mafeking Mail*, flourishes another Kafir journal with an unpronounceable title. This Bechuanaland native thunderer proudly boasts of its desire to have nothing to do with Whites, either socially or otherwise, preachings which, in view of latter-day Ethiopian church developments, give cause for deep thought to all concerned.

The New Colonies and Natal

In the Orange River Colony, the two chief newspapers are published in Bloemfontein: the *Bloemfontein Post*, owned by the Argus Company, and *The Friend*; the former strongly Imperialistic in politics and the latter advocating what, for convenience, I shall call Boer National ideas. Strangely enough, they are just the reverse, politically, of what they were before the war. The *Friend* then was the champion of the Uitlander and the sworn enemy of the Dutch ideal, while the *Bloemfontein Express* (the *Post* of to-day under another name), founded by the late Mr. Carl Borckenhagen, was the impulsively staunch henchman of the former Boer Government on either side of the Vaal.

Cutting across the Drakensberg eastward to Natal, we find leading the van in journalism the *Natal Mercury*, published in Durban. Founded by the late Sir John Robinson, first Prime Minister of the Garden Colony, it has always held, in Natal, a position akin to that enjoyed by the *Cape Times* in Cape Colony. Under its present editor, Mr. C. Woodhead, who has been at the helm for many years, it stands for all that is sound, sober, and sensible in the conduct of affairs. The wants of the Durban people are fully and ably supplied in the afternoon by the *Natal Advertiser*, which, like the *Times of Natal* in Maritzburg, ably conducted by Mr. C. Don, displays conspicuous smartness in its methods. One of the most useful commercial South African weeklies issued at Durban is the *Natal Colonist*, whilst a very smartly compiled technical and engineering monthly, *Industries*, edited by Mr. Robert Dives, commands a wide colonial circulation. At Maritzburg, the chief morning journal—belonging, like the *Natal Advertiser*, to Mr. Peter Davis, the chairman of the Natal Bank—is the *Natal Witness*, also one of the most creditable specimens of Colonial journalism.

While, owing to its comparative youthfulness, not possessing the traditions of the Cape newspapers, the Transvaal Press can claim to have had in many ways a more striking and fascinating career. I do not propose to go into the history of the pre-war period except to say that, whether they belonged to the school of political thought represented by the Johannesburg *Star* and the Pretoria *Advertiser*, or that other school led by the *Standard and Diggers' News* and the Pretoria *Press*, they were, by unanimous admission, uncommonly good specimens of journalism and worthy forbears of the post-bellum productions. The *Star*, founded at Grahamstown and transferred to the Rand by the lamented Mr. Thos. Sheffield, is the eldest of the three Rand dailies, and has had a succession of distinguished editors, amongst whom I may recall Francis Dormer, perhaps the most pungent writer South Africa has ever known; F. H. Hamilton, now one of our younger magnates; C. F. Finlason, cricket and tennis champion, and author of *A Nobody in Mashonaland* and other humorous books; R. J. Pakeman (who subsequently became first editor of the *Leader*, and whose caustic pen was one of the most powerful weapons in the Uitlander armoury), and W. F. Moneypenny, who resigned the other day owing to his differing from the proprietors of the *Star* on the Chinese labour

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question. Its present conductor is Mr. Basil Worsfold, whose literary gifts are too well known to need any description from me. The *Transvaal Leader*, owned by the *Cape Times*, Limited, who took it over from the original proprietors after the war, maintains it has the greatest circulation of any morning paper in the country. Its younger contemporary, the *Rand Daily Mail*, puts forward the same claim, and it is difficult to know which statement is correct. What I do know, however, is that both newspapers are as up-to-date as could be desired. Indeed, all the chief South African newspapers are admirably served in their cable services, their foreign news supply equalling, if not surpassing, anything of the kind to be found in Australia, Canada, or New Zealand. The *Leader* owes its present eminence largely to the energy of its managing director, Mr. E. J. Edwards, for some years prominently connected as managing editor with the *Cape Times*. The *Rand Daily Mail* is remarkable chiefly for the brightness of its news and generally for its smart appearance. Founded by the late Mr. Freeman Cohen, its first editor was Edgar Wallace, the clever war correspondent of the London *Daily Mail*; and after his return to Europe, Mr. George Adamson, the present chief editor, a veteran Transvaal journalist, took control, and is most ably assisted by that brilliant writer Mr. F. W. Spencer, another old *Daily Mail* expert. The annals of Rand journalism would certainly not be complete without a reference to the famous *Transvaal Critic*, founded in 1888 by Mr. Henry Hess, which, after being suppressed in the pre-war days for its criticisms of the Boer Government, now prospers exceedingly, and, strange to say, mostly by its pungent criticisms of the Milner Administration, which it maliciously dubs a "Kindergarten *in excelsis*."

Quite unique in its excellent technical editorial contents stands the weekly *South African Mines*, owned by a popular Rand pioneer, Mr. Clem Webb, one of the best-written publications of its kind in the world, and justly looked upon as the semi-official organ of the great financial and mining groups, who are entrusted with over 300 millions sterling of the public's money in the development of the vast mineral wealth of the unequalled Witwatersrand Banket Reefs.

Leaving the golden city we find on the Reef (at Boksburg), the ever bright and most independently edited *East Rand Express*, the *Krugersdorp Times*, the *Heidelberg News* and the *Standerton News*. At the capital the *Transvaal Advertiser*, an old-established and reliable journal, apparently always fated to be "again the Government," and the *Pretoria News* (a smart afternoon daily), supply the wants of the English reading population, whilst *De Volkstem* and *Land en Volk* wield as considerable an influence amongst the Boer population throughout the new Colony as the Bond journals do in the Cape Colony. The *Volkstem* is published daily and bi-weekly under the editorship of Dr. F. Engelenberg, and has a very large following amongst the Boers in the country districts, whilst materially differing from the *Land en Volk*, which is published more in the real Afrikander interest by Mr. Eugene Marais.

In the country districts, good local work is being done by the *Klerksdorp Record*, the *Potchefstroom Budget*, the *Lydenburg Times* and *Volksrust Recorder*, the *Zoutpansberg Review*, the *Times of Swaziland*, and last, not least, by the *Goldfields News*, a bright and crisp journal, published at Barberton by Mr. Bailey, giving particular attention to important contemporary developments at Delagoa Bay.

In the West

Bidding good-bye to the land of Rhodes and Kruger, we reship at the Cape and sail north along the West Coast. Here the *Deutsche Sudwest Afrikanische Zeitung* is produced under considerable difficulties, local business support being conspicuous by its absence. The only up-country enterprise, the *Windhoeker Anzeiger*, long since joined the great majority, and the Herero revolt, which has brought for the present everything to a standstill in the Colony, will certainly not encourage the starting of another inland journal for a good while to come.

The Portuguese West African Colonies, Mossamedes, Benguela and Angola, have, as far as I am aware, apart from the publication of the usual official *Bulletin*, only one newspaper, the *O Mercantil*, issued at San Paul de Loanda. In the French Congo there is the *Journal Officiel du Congo Moyen* at Libreville, and another at Gaboon, as also in the Belgian Congo the official *Gazette* is probably the only representative of Pressdom. In the German Cameroons and Togoland there are as yet no papers, but developments are imminent in that direction.

Nigeria is still without any journal, but Lagos, stretching from the boundaries of French Dahomey to the Gold Coast, has the *Lagos Standard* and *Lagos Weekly Record*, besides the *West African Defender*, the three latter

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conducted by negro editors in highly picturesque English, miserably printed, and catering for the missionary and Mahomedan population. The Gold Coast Colony has four weeklies: the *Gold Coast Leader*, *Gold Coast Chronicle*, *Free Press* and *Gold Coast Express*, which do not shine either in editorial ability or originality of contents. The Sierra Leone journals are of a better class: the *Sierra Leone Weekly News*, with a monthly issue proudly nominated the *Sierra Leone Royal Gazette*, and an occasional publication, the *Artisan*, being creditable productions. They are likewise edited, composed, and printed by educated natives.

In the Negro Republic of Liberia about half a dozen publications are turned out in remarkably well-got-up style, their good paper and American type being a distinct contrast to the adjoining British native productions. The *Liberia Recorder*, *Liberia and West Africa*, and a local *African World*, are the best known journals, and provide in their peculiar characteristic mixture of semi-religious reading with general news a rather instructive spectacle.

The *St. Helena Guardian*, a neatly printed weekly, published at Jamestown, had an unexpected boom during the internment of thousands of military Boer prisoners during the late war. The only journal on Madeira is the *O Direito* of Funchal, which lovely city, with its perpetual influx of tourists, not to speak of the innumerable visitors from the weekly Cape liners, should certainly be able to support a small tri-weekly, eight-page English sheet. By far the greatest display of characteristic local journalism is found in the *Canary Islands*, where, at Teneriffe (Santa Cruz) alone, half a dozen daily newspapers appear, amongst them the *Diario de Teneriffe*, the *Republican El-Memorandum*, *La Opinion*, *Ultima Hora*, and a host of special weeklies of satiric, literary, scholastic and in one case even spiritualistic tendencies. Other journals are issued at Laguna, the *Valle de Oratava*, under the shadow of the Great Peak, and at Las Palmas (Grand Canary); the *Canary Islands Review* (the only English paper) only during the winter season for visitors; the *El Liberal*, *El Telegrafo*, and quite a dozen others. The Canary Islands have no fewer than forty different journals, printed in Spanish, the population for which they cater being close on half a million souls. Of these quite half, however, are unable to read.

Algeria and Morocco

Journalism flourishes in the French African colonies, and the province of Algeria has alone over 100 different newspapers; many having special wires and issuing evening editions. The Algerian Press compares favourably with the French Provincial Press. I submit the names of the most important, further comment being impossible on account of space exigencies:

La Dépêche Algérienne, a well-equipped daily, founded in 1884, set with linotypes and printed on rotary machines; *Journal Général de l'Algérie*, founded in 1887; *Le Mobacher*, founded in 1849 (printed in French and Arabic), the leading Arab organ in Algeria; *Les Nouvelles*, *La Vie Algérienne*, *L'Independent*, regarded as the most important paper in Algeria. And a long list of others whose titles, if printed here, would alone fill nearly half a page of The World's Work.

Tunis has fourteen different French and Arab papers; the most important being *La Dépêche Tunisienne* and the *Dépêche Sfaxienne*.

In Morocco we have the *Al-Moghreb-Al-Aksa*, published at Tangier, which lately absorbed the *Times of Morocco*, and is printed in English—a very newsy little journal, enjoying a good local and general circulation in the neighbouring British stronghold across the Straits. There is further the French *Reveil du Maroc*, the *El Marsul* (Arabic) and the *Eco Mauritano*, a solitary weekly journal issued in Spanish, which completes the output of the Fourth Estate in Sunset Land, soon to be so prominent in the world's political developments.

At Fez, Mogador, and Casabianca, there is a variety of native (mostly Moorish) publications, including one or two printed in Hebrew for the large Jewish community, of whose tendencies so far little is known. The Tripoli Protectorate has one or two Arabic-French sheets of minor importance, which completes our "Round Africa" trip in search of Press developments to date.

Great Journalistic Activity

African journalists and printers of the Dark Continent are advancing everywhere with the spirit of our progressive times. The splendidly executed half-tone supplements, second to none produced in Europe, issued with clock-work regularity in the weekly mail editions of the Cape, Rand, and Pretoria papers, are now looked upon as quite an ordinary thing in the day's work. Linotypes by the hundred are ticking from Capetown to Alexandria, and cable services, costing up to £20,000 per annum for two or three papers only, are viewed as being quite

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an ordinary feature on the sheet which is perused over the breakfast table in the southern Colonies of the African Empire. Since the period when the news of the day was recorded on papyrus rolls on the banks of the Nile, the journalist has been and is to-day one of the most potent factors of his generation. His marks can be found from Spartel to Agulhas, from Cape Verde to Guardafui—great records in the history of the World's Work as far as the Dark Continent—and a factor which could not be spared—are concerned.

PAWNBROKING AND THE POOR

A GREATER EVIL THAN THE PUBLIC-HOUSE—THE PAWNBROKER, HIS MANNERS AND METHODS—A LAX LAW—THE TRADE IN PAWN-TICKETS—SCENES IN A PLEDGE OFFICE—WANTED, STATE OR MUNICIPAL PAWNSHOPS

BY

H. R. BOYLE

THE poor are to be always with us. We have Biblical authority for the fact, and, even had we not, a glance around is sufficient to convince us of the truth thereof. There are various degrees of poverty. Many people never reach the actual border line, though they are always hovering on the edge of it. For them life is a perpetual hand-to-mouth existence, and the pawnbroker is their banker. They are incessantly wanting accommodation, and they have to pay 25 per cent. interest for it. But besides this large class there are the really poor, that vast army outside the workhouse who are not on the boundary line of poverty but on the boundary line of starvation, who know by fearful and constant experience what it is to be cold and wet and hungry. For them the pawnbroker is of no avail, for the simple reason that he has long since become possessed, under the automatic clause of the Pawnbrokers Act, of all their property. They have nothing now to realise on, but it is hardly any exaggeration to say that they have been materially aided on the downward path by the charges and exactions, legal and illegal, of the pawnbroker.

We hear much of the publican and his misdeeds, but little of the pawnbroker. The pawnbroker, except when he is unfortunate enough to be found out and is consequently haled before a magistrate for dealing in stolen property or some little peccadillo of that kind, is very little in evidence. His gorgeous sign, its origin and import but now little remembered, certainly stands out prominently, mostly in the mean streets of our large towns, but to the great mass of the population it conveys nothing. They have no dealings with him and no desire to have any. A walk across his threshold is regarded as a shameful act, an outward and visible sign that the man or woman taking the step is on the downward grade. The pawnbroker amongst this class is, if considered at all, curtly dismissed as a "necessary evil," just as if any evil were necessary. He is practically free from criticism and he is largely a law unto himself. He is a legalised usurer, plying his trade under the sanction and security of the law. He is the pest of the poor, the aider and abettor of the drunkard and the criminal. His utility under any circumstances is more than doubtful, and his abolition would do far more to aid the poor and rescue the lower stratum of society from its present state of degradation and awful poverty than the shutting up of all the public-houses in the country.

For some years past I have made a study of the pawnbroker, his manners and methods. I have visited his pledge offices at all hours in every part of London, I have learned most of, if not all, his tricks, and I have come to the conclusion that it is quite time some one's pen set about depicting in vivid colours what he is and what he does, and that the public should be asked to consider seriously why the law should cover with its protecting wings this curse of modern civilisation, whose offices are the refuge of the weak, broken down, and destitute, on whose infirmities he plays and out of whose poverty he grows rich.

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What is the *raison d'être* of the pawnbroker, and why should the law interfere with and attempt to regulate his *modus operandi?* How far does that interference go and to what extent is it effective? These are questions that naturally arise at the very outset of an investigation of the subject, questions an answer to which very largely clears the ground and enables the whole matter to be calmly and dispassionately investigated. The defenders of the pawnbroker—because he has defenders and champions and journals devoted to his interests—would tell us that the pawnbroker is simply one of the products of the great law of political economy in accordance with which money has become almost the sole medium of exchange, and the possession thereof, to some extent at any rate, a *sine quâ non* of the conditions of modern civilisation. A man to live as the world is organised must have money, and if he cannot earn it at all or in a sufficient quantity for his needs he must procure it by some means if he is to exist. The simplest plan is to borrow it, but the lender requires two things, security for the repayment of the loan and interest for the use of it. When the loan is for a large amount and the security pledged is in a form easy to handle and simple to negotiate, the functions of lender are performed by banks and money lenders whose operations and business methods are almost altogether unchecked and are left to the healthy stimulus of competition. The man who desires to borrow £100 to £100,000 and can deposit deeds or other documents as security for the repayment of his loan can perform his operation swiftly and secretly. Furthermore, the operation is not as a rule attended by any shameful surroundings, and the borrower need not necessarily feel either demoralised or degraded by the process of borrowing. He disguises his proceeding under the appellation of business, and he approaches and leaves his banker's office having sought and obtained a loan without any feeling that he has performed a degrading action and taken an effective step on the high road to perdition. He has, in a word, not forfeited his self-respect. When, however, we descend to the habitués of or visitors to the pawnbroker's office we find a very different state of things. The pawnbroker, though he advertises that he "lends money to any amount," for the most part lends it in small sums and invariably on portable security of some kind. The law affects to curb his transactions and check the amount of interest he charges, but it has effected this by making a preposterous maximum rate the minimum interest. The pawnbroker may not charge as interest more than 25 per cent. per annum provided the loan is for not less than a month, but he is authorised to charge this amount no matter how substantial the security deposited with him may be, and if the loan be for less than a month the interest charged is of course proportionately greater. It may indeed range as high as 750 per cent.—under the ægis of the law. The man who desires to borrow a sovereign for one day and deposits for the loan, say, a watch of the value of £20, has to pay a sum of 6*d.* for the accommodation, while the lender is amply secured against the loss of either his principal or interest. Of course were pawnbroking conducted altogether on such lines as these, viz., the lending of sums large or small for short periods on ample and easily realisable security with the minimum of a month's interest always payable, pawnbroking quite evidently would be the most lucrative trade in the world.

The vast amount of the business transacted by pawnbrokers is, however, not of this nature. Their customers come not for the most part to borrow sovereigns on watches or jewellery but shillings and even pence on the wretched duds that clothe their attenuated bodies; clothes are in fact the staple security accepted by the average pawnbroker. The storage of these is a matter of considerable difficulty, and the obligation to retain each article for a period of over twelve months acts injuriously in many ways. Fashion in clothing changes; it deteriorates owing to climatic and other causes, and the disposal of it when unredeemed is often difficult except at a sacrifice. These facts cause pawnbrokers to lend on articles of clothing a sum of money ridiculously low in proportion to the value of the article pledged, and also induces them to make a second-hand store a necessary adjunct to their pawnbroking business. Here most of the articles pawned for ten shillings or less, which automatically become the property of pawnbrokers at the end of twelve months and seven days, are stocked. Manifestly on such articles the pawnbroker has an interest in lending as small a sum as possible. He has the reversion of them, and consequently the cheaper he obtains them the larger his profit is when they are sold in his store. No pawnbroker should be permitted to conduct any subsidiary business on his premises. It leads to the grossest irregularities and a "faking" of books. Whoever heard of any one drawing a surplus on an unredeemed pledge sold by auction? The person pledging it

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has a right on payment of a penny to examine the pawnbroker's books and claim any sum in excess of the principal and interest due on the pledge to the date of sale. In a long experience and in spite of many inquiries I have never been able to learn of one solitary person fortunate enough to draw a surplus after inspecting a pawnbroker's books. They almost invariably show a deficit due to the pawnbroker. The auction sale is usually a mockery, the goods are bought in for the pawnbroker and find their way back to his shop, where they are sold at a handsome profit.

The interest permitted to be levied by a pawnbroker is defined by Act of Parliament up to loans of £2. Over that sum he may make a special contract with the pledger and charge what interest he pleases precisely as any other money lender. But pawnbrokers, or most of them, having to do with persons who not only want money but must have it without delay, very largely evade the law and pile up charges, I suppose not illegal inasmuch as the pledger is assumed to consent to them and tacitly does simply because he cannot help himself. For example, the unfortunate woman who pawns her husband's boots to obtain perhaps food for her starving child and mayhap receives a loan of one shilling and sixpence is charged, in addition to a halfpenny for the ticket, a penny for hanging the boots up, or if it be a coat a penny for a similar purpose, or, if a clock or something of the kind, a penny for storage. When the article is redeemed and the pledger does not wish to convey it through the streets uncovered the pawnbroker kindly wraps it up and charges a penny for the paper. Now the article in question may only be in pledge a day or two, and the interest thereon is merely a halfpenny. But, as I have shown, the pawnbroker in most instances manages to charge an extra twopence. I do not of course contend that all pawnbrokers practise these exactions, but I say that the larger number do, and that these exactions are most rife in the poorer neighbourhoods, and, consequently, in respect of the very class who can least afford them.

The permission granted to pawnbrokers to make special contracts for amounts over £2 is indefensible in every way. The pawnbroker can charge what he lists either in the shape of interest or any other respect. I have seen one of these contracts which provided that in the event of the pledge not being redeemed and being sold the pledger could only inspect the pawnbroker's books as provided by law on payment of a sum of half a sovereign. These special contracts in law require to be stamped, but the vast majority of pawnbrokers evade this duty and trust to luck. If the law thinks fit to license a pawnbroker and legalise his charges it certainly ought not to permit him to wriggle out of the provisions of the law when he lends money on special contract.

The Act regulating a pawnbroker's business enacts that he shall not do certain things and must do other things, but the machinery for ensuring that he conforms to the law is so cumbersome as to be ineffective. I have known the case of a pawnbroker charging interest over and above the legal amount and refusing to deliver the goods until the same was paid. The pledger thereupon demanded back the tickets which he had put down on the counter. The pawnbroker declined to give these back unless the interest to date was paid, as also the charge for new tickets, on the ground that the tickets had been handed to him and the goods claimed. On a policeman being called in he refused to interfere, stating that the dispute was simply a matter for civil proceedings. This decision may or may not have been good law, but it was not over-consoling to the man who on a Saturday evening desired to take out his Sunday clothes. Of course the matter ended, as disputes between the pawnbroker and the poor always do end, in the pawnbroker having his illegal charge paid. This pawnbroker, who lived in a poor neighbourhood, always, I may remark, claimed an additional month's interest upon anything pawned for more than a month on the specious pretext that if the article redeemed had been pawned only for one day he would have been entitled to a month's interest!

The metropolitan police are well acquainted with the fact that a large number of pawnbrokers are closely in touch with the receivers of stolen goods as also with professional thieves. The risks run by pawnbrokers in regard to taking goods they very well know have been stolen or improperly acquired are infinitesimal, while the punishment meted out when they are discovered is absurdly disproportionate. Were pawnbrokers abolished there would without doubt be a considerable diminution in crime. If pawnbrokers are to continue to be licensed and protected in their charges—a protection, by the way, the ordinary money lender does not now fully possess—they certainly ought to be subjected to much more drastic supervision.

Some of my readers may possibly have had experience of the fact that a goodly traffic

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is nowadays done in tickets for articles of jewellery, &c., pledged with pawnbrokers. A ticket for, say, a ring pawned for £10 is offered for sale on the ground that the pledger is unable to redeem. Woe be to the confiding man who pays perhaps a sovereign for the ticket and then pays the principal and interest due on the pledge. If he subsequently seeks to pledge the ring with the same pawnbroker, the latter will certainly laugh to scorn any proposal to lend £10 on the ring and proffer a "fiver" as the utmost he can do. In a case such as this there had in the first instance been no genuine pledging. The pawnbroker and the person selling the ticket had stood in together. It is curious what a comparatively large proportion of pawnbrokers are engaged in this fraudulent game. Sweating and filing articles of jewellery pledged is another source of income which some pawnbrokers do not despise. It can be practised with comparative immunity, as but few persons minutely scan an article when redeemed. They are in too great a hurry to get clear of what most people consider polluted ground. If a claim is subsequently made the pawnbroker naturally waxes indignant, and of course legal proof is almost impossible. Besides, there are but few persons who would care to take the necessary steps to obtain reparation in the matter, as such would involve an undesired publicity.

There is probably not a more nauseating place in a civilised country than the pledge office of a pawnbroker in a low London suburb on a Saturday evening or Monday morning. The boxes are crowded with gaunt, ill-clad, and evidently ill-fed persons, for the most part women, clamorous either for their clothes or their money. The pawnbroker's assistants are just what one might expect to find in such an inferno. Delicacy, or indeed decency, there is none. Garments which in polite society are never even referred to are displayed on the counter *coram publico*, while lewd jokes and vulgar banter are the order of the day. Nothing is sacred to the individuals behind the counter. They will finger, appraise, and pass remarks on a wedding or a mourning ring precisely as they will appraise and discuss the state, condition and vicissitudes of a female customer's undergarments. These pawnbrokers' assistants have always struck me as being very low in the scale of modern civilisation. Their manners and their methods are atrocious. They and their masters are the vampire bats who live by sucking the blood of the poor and needy and, while growing rich on the process, treat their victims with a contempt which is in no wise disguised. The apologists of the pawnbroker assert that he performs a useful function inasmuch as he lends money often urgently required "there and then." The fact may be admitted, but the converse of it is also true, viz., that the facility with which money can be obtained from him "there and then" is just as often a very great evil. But admitting that this function of lending money quickly is advantageous, there does not seem to be any reason why the lender should be empowered to charge extortionate interest and to levy other charges which sometimes amount to more than the interest. The pawnbroker, it must be recollected, always lends on absolute security which remains in his hands, or, if he does not, the fact is due either to his want of knowledge or lack of judgment. My experience would induce me to say that in ninety-nine cases out of a hundred the pawnbroker holds security largely in excess of the principal and interest on the loan. So well is the fact recognised that pawnbrokers' tickets for jewellery at any rate are nearly always a marketable commodity, a fact, as I have already shown, utilised to bolster up a pawnbroker's swindle. No man in commercial life would think of paying 20 to 25 per cent. interest to his banker for a loan on marketable securities. And yet the law permits the pawnbroker to levy this charge as a right.

The pawnbroking system as it has grown up and developed is rotten in every respect. Moreover, it is productive of great evils and is largely responsible for much of the existing crime, misery, and wretchedness in our great towns. It is a very serious obstacle to the growth or cultivation of thrift among the working classes. The pawnbroker is the necessary adjunct to the publican, and a goodly proportion of the former's customers make their succeeding call on and invest some of their borrowed cash with the latter. The evil is, I believe, pretty generally admitted and the remedy is by no means difficult. Indeed, the difficulty really is that the pawnbroking interest is powerful and the pawnbroker can look, and not look in vain, to the publican to come to his aid if Parliament attempts to what is called "harass" him. France in her *monts de piété* has successfully solved the difficulty of providing for what are called the lower classes facilities on an emergency to borrow money on property at a reasonable rate of interest. The *mont de piété*, besides its moderate interest, has the advantage of being a State organisation

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properly conducted, whose *raison d'être* is to offer needed facilities to and not to exploit and bleed that class of the community which is least able to protect itself. Whether *monts de piété* should be under State or local control is a mere matter of detail. There are objections to municipal pawnshops, no doubt. There are few things in this world, actual or contemplated, to which objections cannot be raised. The pawnbrokers, I am aware, strongly object to either State or municipal pawnshops, and can be very eloquent on the relative merits of individualism and collectivism—from the pawnbroker's point of view. The pawnbroker is a conservative as regards his trade. He thinks it an excellent system, as he has done excellently by it.

We can sympathise in his view of the matter without being convinced by it. In my humble opinion the pawnbroking system has been permitted to last so long solely and only because the great mass of the public has no conception of it. If they knew it as I do it would not be worth a year's purchase. It is a degrading and disgusting trade, unlovely at the best; what it is at its worst I will not permit myself to define. It degrades every one connected with it. The man or woman who even once crosses the portals of a pawnshop never quite feels the same again. He or she has, if only for a minute or two, breathed the atmosphere of a den wherein vice and crime, misery and wretchedness stand day after day haggling, expostulating with, entreating, threatening the callous faces entrenched behind the counter, a place wherein the moral atmosphere is as pestilential as the physical. Here once-treasured keepsakes, mementoes of holier and happier times, are fingered and appraised by the pawnbroker's ghouls, and things which at one time money could not buy and money could not appraise are turned into cash, amid unseemly laughter and indelicate words, to satisfy perhaps the cravings of hunger or some craving more dreadful still. It is a horrible place.

Let us hasten to close the swing door on it and come out again into the comparatively pure atmosphere of the street. I have taken my readers there for a moment to endeavour to show them what it is, not out of mere vulgar curiosity but with a view of impressing on them the terrible evil that is in their midst, established too under the ægis of the law. The pawnbroking system, as it has grown and developed, is past tinkering with. It must either be abolished *in toto*, or if it is found impossible to do that the pawnbroker's monopoly must be swept away by the introduction of some such system as that which obtains in France. It matters not whether the English form of the *mont de piété* be State or municipally managed. This is a detail. But its introduction is urgently needed, and I sincerely hope may not be long delayed.

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THE HUNTSMAN AND HIS KENNELS

BEHIND THE SCENES WITH THE HUNTSMAN—THE MANAGEMENT OF HOUNDS —A COMPLETE ACCOUNT OF THE DAY'S WORK IN AN ARDUOUS CALLING

BY

WALTER M. GALLICHAN

AUTHOR OF "FISHING IN WALES," "FISHING AND TRAVEL IN SPAIN," ETC.

Illustrated from photographs specially taken for THE WORLD'S WORK

TOWN-DWELLERS who know little or nothing of the sport of hunting with hounds are wont to imagine that the calling of a huntsman spells a life of ease. Even among the followers of foxhounds and harriers there are not a few who appear to suppose that the work of hunting is almost restricted to the chase itself, and that the Hunt servants enjoy a protracted holiday from the middle of April until the harvest is gathered in September. "You fellows lead a gentleman's life in the kennels," remarked a cockney sportsman to a huntsman and his whipper-in. "A gentleman's life," in the common acceptation, means a life of unlimited leisure; and there cannot be a greater error than to surmise that time hangs heavily on the hands of those hard-working men who are known as Hunt servants.

Work in the hunting-kennels is something more than feeding hounds and putting down litter for their beds. The uninstructed spectator at a meet of foxhounds on the lawn before the manor-house has no idea of the immense care and labour expended in the kennels. He is like the boy at the play who is ignorant of the bustle and strenuous energy behind the scenes. Hunting is only one department of a huntsman's activity.

When a master of hounds speaks of "a good man in the kennels" he means a kennel huntsman, a genius in the selection and breeding of hounds, a tactful lieutenant, a patient trainer of young whippers-in, a clever economiser in expenditure, a shrewd educator of hounds, firm, but not ill-tempered, and an adept in the treatment of canine disorders. It is not every huntsman who is as able in the matter of hound management as in the art of the chase. A man may possess an excellent faculty for controlling hounds in the field, while he may lack the essential qualities that go to the making of a reliable kennel huntsman. He may be a bold rider, judicious in handling his pack when hounds are at fault on a cold scent, and he may possess a wonderful acquaintance with the wiles of a hunted fox. Yet the good field huntsman may fail in the equally important business of kennel work.

A certain amount of severe labour is inseparable from the management of hounds. The hours of work may be irregular, but they usually occupy the greater part of a huntsman's day, from half-past six in the morning until late in the evening. There is no season of the year which can be called "a slack time" for the workers in hunting-kennels. Rising at six, or soon after, on a hunting morning, the huntsman and his assistants don their long white kennel-coats, and prepare for the walk out with hounds along the road. In almost every hunting establishment the pack is taken for walking exercise from seven till eight each morning. Swilling down and thoroughly cleansing the floors of the kennels, and the concrete yards, partitioned off for dogs and bitches, are also daily operations before breakfast.

After their meal, the men are ready, in the costume of the Hunt, to mount their horses, and trot the hounds to the meeting-place. The fixture may be sixteen miles or more from home; and if the hour of meeting is eleven, an early start must be made, so that horses and hounds may arrive, fit for work, a quarter of an hour before the appointed time. It often happens that hounds do not reach the kennels again until six or seven in the evening. The huntsman and his attendants may be drenched from long hours of exposure to driving rain, and it is safe to say that they will be keenly hungry after their severe exertions; but before comfort and food await

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them, they have to feed the ravenous hounds, and put them to bed on clean litter.

The feeding process is not hurried over, nor are the hounds allowed to scramble at their will at the troughs. Each hound is called by his or her name to the repast, which is prepared in a long wooden trough, kept scrupulously clean. In some kennels, three or four couples of hounds are fed at a time, and a careful huntsman will always allow the lighter-made and spare-feeding members of the pack to eat their dinner alone. It is part of the tradition of gallantry that "ladies should be first," and in the kennels place is given at feeding-time to the female hounds.

But there is more to be done after hunting besides giving food to the hounds. Gadfly is limping from a thorn in her foot, and Ranger has torn the skin of his leg on a spike of underwood in covert. The thorn must be sought for and extracted at once, or her ladyship may be laid up for some time with a festered pad. Ranger's leg also needs immediate attention, and a dressing with a healing tincture. Then the quick eye of the huntsman notes that Frivolous is off her feed, and overdone—and, if needful, the bitch is sent to a private quarter of the kennels known as the hospital.

The tired hounds have now stretched themselves on the soft beds provided for them upon gently sloping benches, and there is a low chorus of snores in the kennels. An hour later, the soiled bedding is removed, and the hounds compose themselves once more to slumber upon fresh litter. The day's work is over, and the huntsman and his helpers seek their beds. But stay—in the small hours the huntsman is aroused from sound sleep by a fearful din, which startles the still night, and may be heard a mile away across country. A free fight has broken out among the hounds. Garnish has passed unpleasant remarks to a lady with whom she is not usually on speaking terms, and the lady has retorted from a copious feminine vocabulary. A savage tussle is the result of the altercation, and sundry friends of the combatants have taken sides, and intervened with sharp remarks and sharper teeth. It is all very human; a private quarrel leading to a faction broil, and a general battle as a sequel. In a pack of hounds you will find almost as much diversity of temperament as in a regiment or a college. A sensitive lady "all nerves," or a surly gentleman with a huge conceit of himself, may occasion sanguinary strife in the kennels, and make night hideous for the huntsman and whipper-in.

If the faction fight is of a serious nature, a tooth-to-the-death sort of encounter, it is useless for the huntsman to quell the disturbance with a mere: "Ah, would yer? Fighting again, you rascals!"—for his voice would be lost in the tumult. It may rain, hail, or snow; still the sleepy man must tumble out of bed, slip on a few garments, and take his whip to the snarling, tearing mass of hounds.

A friend of mine who owned a pack of harriers in the West of England was once badly mauled in the middle of the night, while trying to suppress a quarrel amongst his hounds. He had the bad luck to trip and fall among the fighting hounds, and in the excitement of the fray, they mistook his bare legs for the backs of their comrades. Being very lightly clad, my friend offered a considerable area of unprotected cuticle to the teeth of his hounds.

There is, however, one mode of silencing fighting hounds, which is almost infallible. This is the spring-gun. A violent bang within a few yards of the combatants usually brings the battle to an end. The gun-trigger is pulled by means of a cord within reach of the huntsman's bed. This spring-gun plan often saves the Hunt servants from leaving their beds on a cold night, after a hard day's hunting.

It will now appear to the non-hunting reader that the huntsman does a very fair day's work during the hunting season. When he returns from the field, his duties may still occupy him from two to three hours. De Ville, huntsman to Colonel Robertson-Aikman's* harriers, the High Peak, tells me that when he hunted a pack of foxhounds he has occasionally been kept busy in the field and in kennels from 7 A.M. till 11 P.M. And yet some of the onlookers at the game think that the life of the professional huntsman simply consists in cantering gaily at the tail of his pack during the day, and drinking merrily by the fire after the return from the chase! It is not quite so rosy as that; though, of course, the vocation of huntsman is healthy and full of interest to the man whose heart is in his work.

On days when hounds do not hunt, they are fed at 10 A.M. Upon hunting-days only those hounds that are left in the kennels are fed in the morning. Any one who has walked a foxhound puppy—that is to say, taken

* The writer begs to thank Colonel Robertson-Aikman, Master of the High Peak Harriers, for permission to take photographs of the kennels and hounds.

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charge of a young hound from the time of weaning to the age of nine or twelve months—will be able to form an estimate of the appetite of a full-grown hound. When the kennels contain from twenty-five to forty couples of hounds, it may be imagined that there is an enormous consumption of oatmeal, biscuits, and flesh during a twelvemonth. We may reckon that twenty-six couples of hounds will eat about a ton of oatmeal in five or six weeks, and a whole horse in a fortnight. The meal is of the best quality. It is boiled to a stiff pudding, and mixed up with a proportion of chopped horseflesh and a little broth or water. Sometimes dog-biscuit is used broken up and added to the meal. Fifty hounds will need a hundredweight of biscuits in a week. One master of hounds has the meal ground from oats grown upon his estate, and instead of horsemeat he gives his pack chandler's greaves, and an occasional feed of swede turnips, which tend to keep the blood cool. When horseflesh is not readily obtained, hounds are kept partly upon sheeps'-heads, offal, and butchers' scraps.

In most kennels, old horses past their work are slaughtered and cut up, and this work falls upon one of the helpers in large hunting establishments; but in smaller kennels the duty is performed by the whipper-in. The flesh is hung up in the slaughter-house until it is wanted, and before it is given to the hounds it is boiled and chopped into mincemeat.

The boiling-house is part of the main building of the kennels. It contains two or more boilers, resembling the coppers used in laundry work, with a fire beneath each one. The oatmeal and flesh are prepared separately. When the oatmeal is cooked it is turned out to cool on a long shallow tray.

An open sunny situation is preferred for the building of hunting-kennels. The soil should be as dry as possible, and the floors laid down with concrete or asphalte, sloping towards a drain in the centre. High railings surround the paved yards, and the paddock, in which the hounds play, is of grass, and also fenced in. A well-appointed hound-kennel is costly to erect. In some cases there is provision made for puppies and sick hounds, as well as the dog-hound and bitches' quarters. There is often stabling for several horses attached to the kennels. A good house is generally provided for the huntsman and his whips, and the huntsman's wife has often a large table to serve. The huntsman's garden is usually within the ground covered by the kennels and exercise-courts. The helpers usually live in cottages adjoining the kennels.

A huntsman in one of the "crack" countries receives a good salary, and has a certain status in the rural community. At Christmas time he can reckon upon several handsome "tips" from the wealthy regular followers of the hounds. His sons and daughters go to boarding school, dress well, and often succeed in business in later life. I know the son of a huntsman who is now a flourishing corn merchant. Many of the sons of huntsmen begin life as whippers-in, and eventually secure positions in the hunting world. It is an advantage to them if they have received a fair education, evince intelligence, and have genial and courteous manners. One whipper-in known to me failed to obtain a good appointment as huntsman to a smart pack of hounds, because he was scarcely able to read and write, and had a somewhat rough manner. In all other respects the man was quite capable.

In the kennels the huntsman has undisputed sway over the assistants. His employer usually gives him a fairly free hand in the management. The huntsman spends his master's cash, takes the control of the whips and helpers, advises in the purchase or sale of hounds, and directs his little world with authority. He is addressed as "sir" by the whippers-in and the kennelmen. All around the countryside the huntsman's features are well known, and many cheery salutations greet him on the way to cover, or in the neighbouring town, where he is often seen on market-days. He is usually a sober liver, and often very abstemious; for if he wants to hold his place to a good age, it behoves him to keep his nerves steady and his constitution sound.

The huntsman deserves his recreations. Sometimes he has a day's shooting with a friendly farmer, or a gallop, as one of the field, with a neighbouring pack of hounds. He is fond of a race-meeting, a cross-country steeplechase, and a horse-show. At the great annual hound-show at Peterborough he meets many comrades of his craft, and talks over the points of hounds with enthusiasm. I know a first whipper-in who rides the bicycle, and takes photographs on his holidays. Several Hunt servants are good cricketers.

Should old age or ill-health prevent a huntsman from pursuing his profession, he may find himself compelled to draw upon the resources of the Hunt Servants' Benefit Fund, an excellent institution. But, as a rule, the huntsman who has lived steadily can usually find a

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STARTING FOR A MORNING WALK

light occupation which will provide for his wants in advanced years. Horse-dealing and training, small farming, and inn-keeping are trades favoured by huntsmen when they retire from the service of the hunt; while a thrifty man may have saved enough in prosperous days to keep him from need in the last years of his life. One well-known huntsman in the South of England turned brewer's traveller after nearly forty years with the hounds.

It is an anxious time in every kennel when bitches are whelping. To keep up the efficiency of a pack of foxhounds or harriers is not an easy task, and it requires a master mind to breed hounds for stoutness, pace, scenting power, and symmetry. Every pack has its fixed standard of height for hounds. In the High Peak country, for example, the hounds, from which these illustrations are taken, are twenty-one-inch foxhounds. They are used for hare-hunting in a hilly country beset with many stone walls. The hares of this district are exceptionally strong and cunning, as they need both strength and intelligence to survive and flourish on the cold limestone uplands a thousand feet or more above the sea. In a flat cultivated country, where hares are less strong, the runs are shorter, and smaller hounds can be employed. Any young hounds above or below the standard of height have to be drafted to other packs; so that hound-breeding is anything but a matter of random calculation.

Bitches sometimes give birth to eight or more whelps, and have more offspring than they can suckle. This necessitates the finding of foster-mothers, and for this purpose big healthy cur-bitches are selected. Besides the risk to the mother's life there is always the fear that the whelps may sicken. Distemper, and a form of jaundice known in the kennels as "the yellows," carries off a number of promising puppies every year, in spite of the huntsman's care and the advance in canine medicine. "The yellows" cause many a huntsman sleepless nights in the early summer. His puppies have been sent to their walks with friends and supporters of the Hunt, and news reaches the kennels that Tomboy, a valuable puppy, is off his feed and moping. When the huntsman reaches the outlying farm where Tomboy is at walk, he

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HORSE-FLESH FOR THE HOUNDS IS BOILED AND CHOPPED INTO MINCEMEAT

finds that the disorder has taken hold of the puppy, and coloured his gums, eyes, and insides of the thighs a dirty yellow. Drugs may save the puppy if the disease is not too severe.

Then there is the terrible malady of kennel-lameness, a species of rheumatism that occasionally affects nearly the whole of a pack.

THE HOUNDS' BEDROOM

This disease is even more dreaded than "the yellows." It is said to arise from the damp exhalations from the earth, and there seems but little doubt that the disorder is hereditary. As a preventive, a careful huntsman will never allow his hounds to be overcrowded on the benches. Blistering, three or four months' rest, and cod-liver oil administered twice a day, may save a hound smitten with this troublesome disease.

If a huntsman has no knowledge of veterinary treatment he is not well up in kennel work. He must know how to blister and bleed hounds, to prepare physic for the distemper and jaundice, to concoct tonics, to dress for the mange, and to heal cuts and sprains. Sometimes he may be called upon to mend a broken limb. Colonel Aikman's huntsman has successfully set a hound's broken leg and shoulder.

There is always more or less doctoring to be done in the hunting-kennels, let the conditions be ever so sanitary. Minor ailments are bound to arise and to cause trouble. One fastidious hound will refuse his food, and must be stimulated by means of quinine; while perhaps another has an injured foot, which needs frequent cleansing and dressing.

It is part of the huntsman's duty to find

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quarters for the puppies until they are old enough to begin kennel-life. Very young puppies do not thrive well amongst adult hounds, and there are few kennels, if any, big enough to accommodate all the young hounds. The master of the hounds can usually rely upon a few subscribers or friends who are willing to take charge of one or a couple of puppies during the summer. But it is not always easy to find a sufficient number of good "walks," for there is a notion abroad that foxhound puppies are very destructive to furniture, boots, and anything upon which they can fasten their teeth. As a puppy-walker, I can only say that my experience has not proved that foxhounds are as mischievous as other young dogs, while the pleasure which one derives from the companionship and confidence of a high-bred and intelligent animal quite outweighs the slight trouble. Nevertheless, considerable power of suasion is often necessary on the huntsman's part before he can find suitable homes for the puppies born every spring. Farmers, publicans, and butchers, who profit more or less through hunting, are often willing to walk puppies. At the annual puppy

A PENSIONER

ARE WE GOING OUT TO-DAY?

A THORN IN THE FOOT

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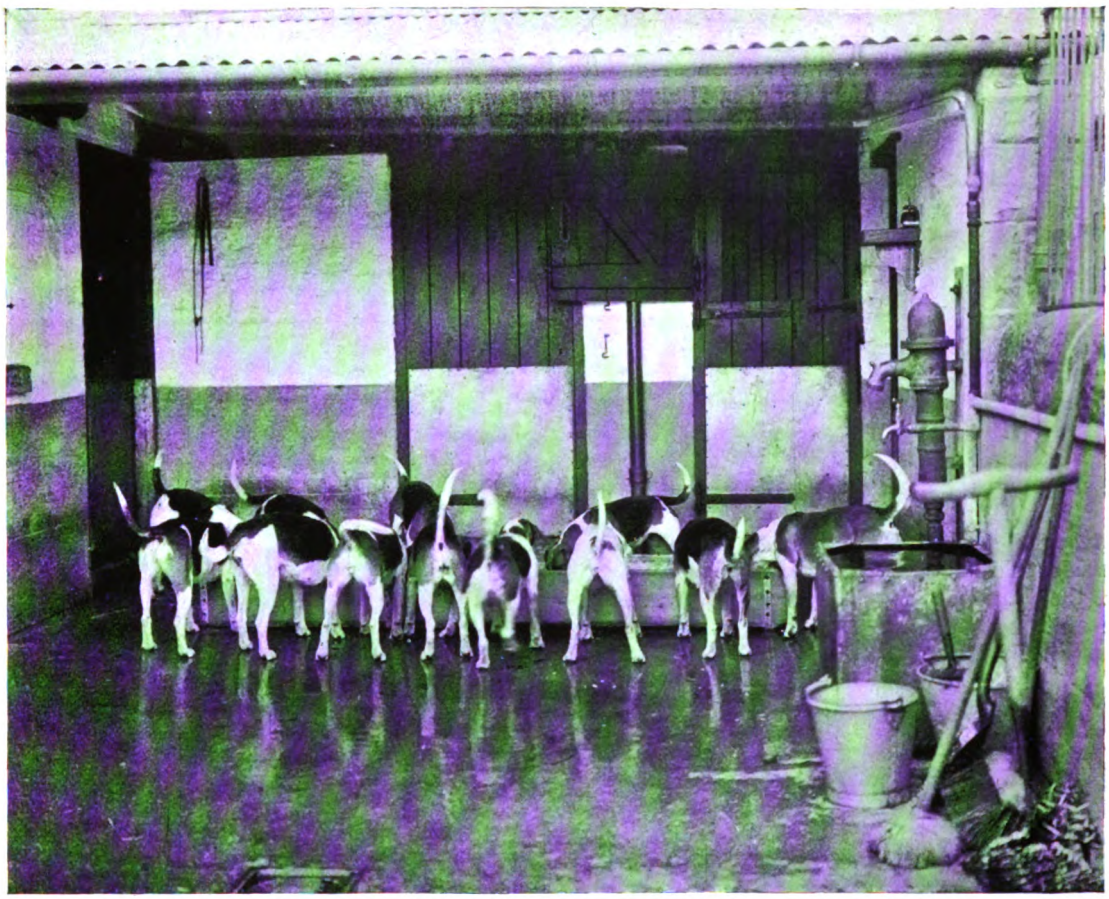

FEEDING-TIME

Each hound is called by his or her name to the repast, which is not hurried over.

show in connection with the Hunt, prizes are given for two or three of the best dog-hounds and two or three bitches which have been walked in the district. Two or more masters of hounds act as judges, and the points of every puppy are carefully studied before a decision is given. A keen kennel huntsman endeavours to rear a good class of young hounds each season, and he is proud to exhibit them to the judges on the show day. Greater still is his pride if one or two couples from his kennels win prizes at the Peterborough Show in the summer.

The breeding of hounds used in the chase of the deer, fox, hare, and otter has been brought almost to perfection in Great Britain. Our country supplies the world with hounds, and representatives of the best strains of the kennels of England are to be found in France, Spain, America, and at the Cape. Such highly bred animals as foxhounds are nervous and excitable; in a word, they possess temperaments which must be studied, and organisations that are subject to specific maladies. A good huntsman can read hound-character as a doctor can determine the idiosyncrasy of his patient. Some hounds are rendered sulky by injudicious flogging, and others require firmer methods of training.

The education of young hounds begins when they return from their walks, though they do not hunt until they are about eighteen months old. Before they are "entered" to fox or hare, the puppies are regularly exercised on the road, to keep them fit, and to harden their feet. Plenty of road exercise is necessary in the summer, when the hounds are taken for long runs. At first the puppies are coupled to old and steady hounds, so that they may learn not to range from the pack. Care is taken to habituate them to the sight of sheep, and if the puppies show a tendency to act as

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sheep-dogs, they are soundly rated and whipped. In countries where there are deer-parks hounds should be taken amongst deer in the summer, and taught not to stoop to the enticing scent.

The final stage of the young hound's education is reached when cub-hunting begins in the autumn. In the dewy mornings of September, long before the sun is up, the huntsman and his whips are astir in the kennels, calling out the hounds. The larger woodlands are chosen for this rehearsal of foxhunting; and one fine morning at about five o'clock, the young hound scents for the first time the trail of a cub, and joins in the eager chorus of his older and experienced comrades. Cub-hunting lasts until November, when the regular hunting begins.

Some masters of hounds present their huntsmen and the whippers-in with a new hunting-coat each season. The old coats are worn for cubbing, but on the opening day the Hunt servants appear in smart new livery. The uniform of the Hunt is rarely donned in the kennels, except on hunting-days. While the men are engaged in the boiling-house and about the kennels, they wear the long coats of washable material in which the huntsman is depicted in our illustrations.

I cannot give an exact estimate of the average annual expenditure in the first-class hunting-kennels of England. Expenses can be kept in moderate bounds by a capable kennel huntsman, who as a rule is not stinted in funds. A thousand pounds a year is not an excessive sum for the maintenance of a pack of twenty-five couples of harriers, the wages of the men, and various incidental expenses. A much larger expenditure is incurred in the case of a pack of foxhounds hunting four days a week, as more horses are required. Of course, there are small packs of foxhounds and harriers which are maintained at very much less than a thousand pounds a year; but in the Shires and other famous countries the cost of keeping up a Hunt is tremendous.

The hunting writer known as "Cecil" (Cornelius Tongue) stated in 1854 that some of the packs of hounds then hunting cost from £3500 to £4000 per annum. "Cecil" makes £1400 a year the average cost of maintaining a pack of hounds. I should say that the expense of hunting is greater now than in 1854. It will be realised, therefore, that every day's work in the hunting-kennels of the United Kingdom involves the disbursement of a very large sum of money.

THE KENNELS OF COLONEL ROBERTSON-AIKMAN, MASTER OF THE HIGH PEAK HARRIERS

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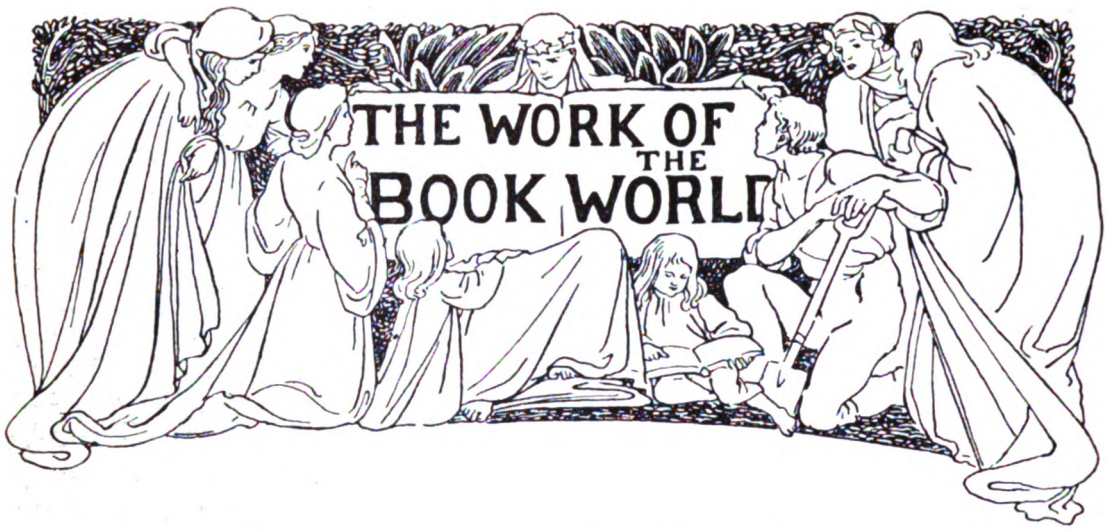

LONDON, *November* 15.

LORD JAMES OF HEREFORD is reported as declaring that out of a multitude, Mr. Samuel Hussey was "the most abused man in Ireland." Certainly the name is well known in the south-west, because for fifty years as a land-agent he had dealings with a large majority of the households of the County Kerry. It is true that he was most heard of in the days of the Land Leaguers, of the Moonlighters, and of the Plan of Campaign; but although his life was often attempted, and his house was actually blown up with dynamite, he still lives on to be eighty years of age, and is pleasantly garrulous, after the fashion of his fellow countrymen.

MR. JOHN FOX

("Christmas Eve on the Lonesome")

His recollections, compiled by Mr. Home Gordon, are published under the title *The Reminiscences of an Irish Land-Agent* (Duckworth, 12*s.* 6*d.* net). It is curious to the English mind how little resentment Mr. Hussey bears against his countrymen, in spite of their rather hostile attentions, so hostile at one time that the road surrounding his estate for seven miles was guarded by constabulary; and when he gave a dance "the hall table was piled so full of revolvers brought by guests, that all the hats and coats had to be taken into the smoking-room." Mr. Hussey is strong in admiration, and strong in antipathy. He seems to have adored the late Lord Morris, who appears everywhere as a hero, and to have bitterly despised Mr. Gladstone. "Although I regret not having met Mr. Gladstone," he says, "I feel glad that I never shook him by the hand." He heard Mr. Gladstone introduce the Land Act of 1881 in the House of Commons, and he says: "He was interrupted on all sides of the House, and in his speech of nearly five hours in length never once lost the thread of his discourse, nor did he, as far as I could judge, ever, even by accident, let slip one word of truth." In Mr. Hussey's opinion Mr. Gladstone's Land Law only encouraged perjury and discouraged agriculture. "It is a positive fact," he says, "that there are professional experts who obtain substantial fees for showing tenants the speediest methods of damaging their own lands." When Mr. Gladstone was, to quote Mr. Hussey, "concocting his treasonable Home Rule Bill," some one advised him that he could get a lot of valuable information from Lord Clonbrock. He told his wife to ask him to luncheon, but she, by mistake,

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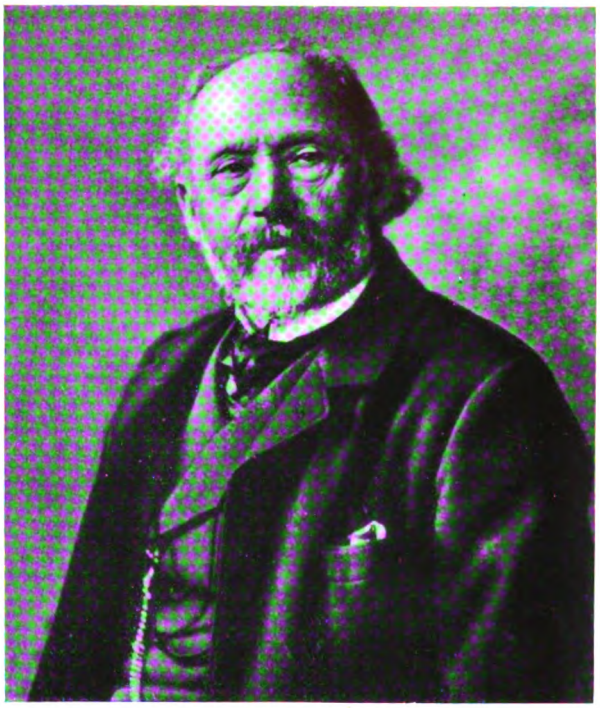
invited Lord Clonmell, the well-known sporting peer, who promptly came.

"It is possible that Mr. Gladstone may have thought him a little odd and his attire somewhat demonstrative, but he was prepared for any eccentricity in an Irish peer, and hardly noticed how excellently his guest was doing justice to the meal while preserving impenetrable silence. Directly it was over, the Prime Minister took him apart, and said: 'Now I want you, privately and confidentially, to give me your view of the exact relation between landlord and tenant in Ireland.' 'Absolute hell, my dear boy, absolute hell,' was the emphatic reply of the old sportsman. That confidential conversation went no further; but I have never been sure that Lord Clonmell in the least overstated the case."

But Mr. Hussey's book is not concerned wholly with politics. Wherever you open it you find some flash of Irish wit. This, for instance, is quoted as the famous sermon of a parish priest on temperance:

"It's whisky makes you bate your wives, it's whisky makes your homes desolate; it's whisky makes you shoot your landlords, and" —with emphasis, as he thumped the pulpit— "it's whisky makes you miss them."



PROFESSOR VAMBÉRY AT THE AGE OF SEVENTY

("The Story of My Struggles")

HEARTH-ROOM IN THE HOUSE OF THE KASI IN THE VILLAGE OF NAMATGUT

("Through the Unknown Pamirs")

There are some very funny stories of Joseph Ronayne, a lawyer, and sometime an M.P. for Cork.

"He was a plucky chap as well as a witty one, for, owing to some internal malady, from which he died, he had to have his leg amputated, at the same time resigning his seat for Cork. Addressing the surgeon, he observed: 'I cannot stand for the borough any longer, but I shall certainly stump the constituency as a county candidate.' A certain attorney named Nagle used to do most of his work. Speaking of another attorney, this Nagle remarked: 'He has the heart of a vulture.' 'I know what's worse,' was Ronayne's comment. 'Indeed!' 'Yes; the bill of an aigle!'"

In fact there is no end of them, nor place here for quotation of more than one more which concerns a honeymoon couple at Killarney. After the manner of his kind the newly

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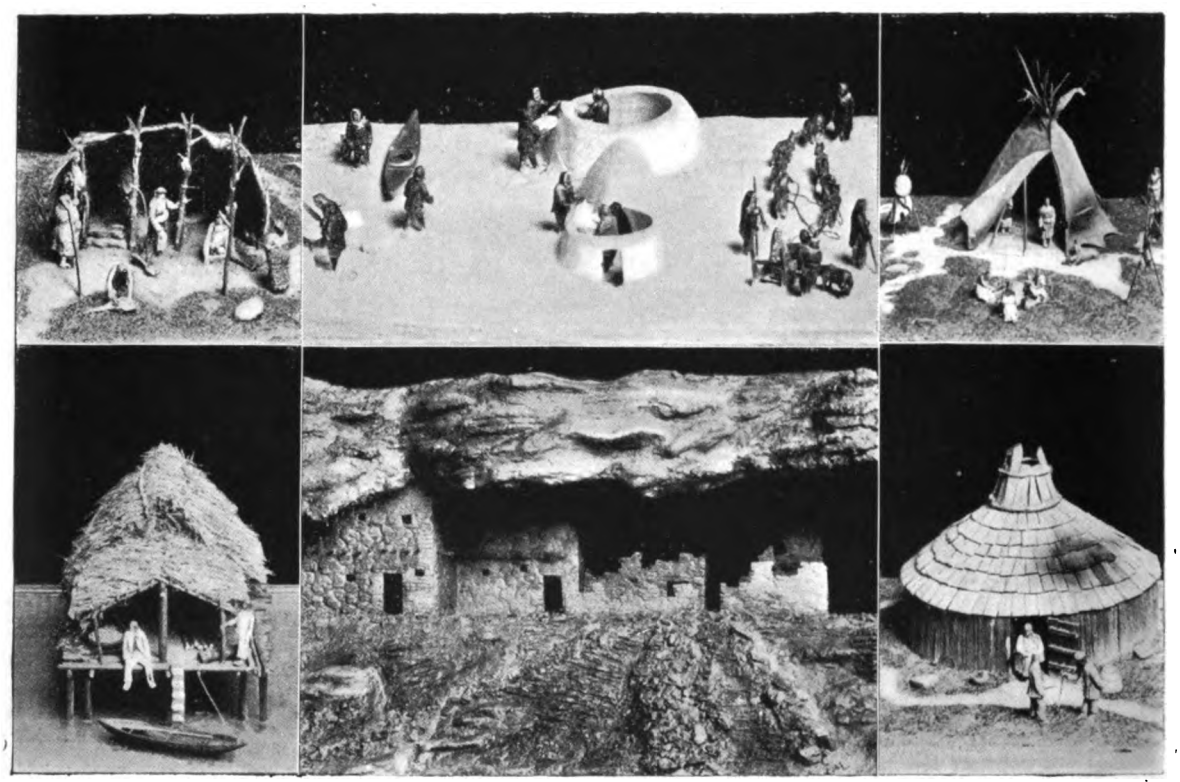
married man had forbidden his servant to tell the people of the hotel that his visit was in the nature of a honeymoon.

"So John promised to be as silent as the grave; but on the third afternoon, as the happy pair were ascending the stairs of the Victoria Hotel, they saw by the giggles and smirks of the chambermaids that their secret had been discovered. The bridegroom rang his bell, and went for John in a towering passion, but the fellow held his ground. 'Is it not unfair the way you are taking on? Sure, the other servants did ask me if you were on your honeymoon, but I was even with them, for I told them devil a bit, your honour was not going to marry the lady until next month!'"



Primitive Indian Shelter
Lake Dwellings (Venezuelan)

Eskimo Snow Huts, Sledge, and Kayak
Cliff Dwellings (Arizona)

Sioux Tent
Round Hut (California)

PRIMITIVE DWELLINGS

(From Professor Geddes' book on "City Development")

A Successful Adventurer

There have been commingled in the life of Professor Arminius Vambéry enough of adventure, of desperate hardship, of brilliant success, to make up a whole library of autobiography as it is ordinarily written. The fact that through his long career his achievements have been grudgingly received, even openly doubted, lends to his recounting of them all the glamour which attends upon the success of soldiers of fortune in other fields. For however one may fully accept the work and ability of this wonderful Hungarian Jew, he cannot but be regarded as a soldier of fortune in the field of letters and learning. The fascinating volumes he has just published are aptly entitled *The Story of My Struggles* (Unwin, 21s. net). Few men reaching the heights he has attained begin the story of their lives with a confession of almost complete ignorance as to the year or day of their birth His father, learned as he was in the Talmud, and in Jewish erudition generally, died shortly after the boy's birth, leaving him to the care of a strong and honest, but quite illiterate peasant mother. . . . She often told her son of his father's brilliant intellect, which she hoped he would inherit; and the career of this son has given the best possible proof of the truth of her statements. The long and tedious but determined efforts which she and the boy made to secure the advantage of such education as they found near at hand, form a record

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of suffering calculated to move the hardest hearts. The picture of Jewish life, particularly that surrounding schools and colleges, is drawn with a vividness and an actuality strongly recalling similar scenes in an autobiographical novel called "The Fugitive" recently reviewed here.

In the first volume Professor Vambéry gives an amusing description of his experiences as the lion of a London season, and the strange impression it all made upon the boy who had been a beggar, even in the streets.

"One must have been in the rushing stream of London high-life, one must have gone through the everlasting feastings, the dinners, luncheons, parties, balls, &c., which fall to the lot of a society lion during the so-called 'season,' to understand how little time one has for thinking, and how a constant intercourse with millionaires makes one fancy one's self in possession of inexhaustible wealth. Day after day the post brought piles of invitations to lunch, or dinner, races, hunting-parties, visits to beautiful country-houses, and all imaginable pleasures and recreations. Hardly a tenth part of the people who thus offered me hospitality I knew personally. I was received everywhere, and overwhelmed with attentions of all sorts. One recommended me to another, and the draconic law of fashion made it everybody's imperative duty to entertain the stranger who was about to publish in England the result of his perilous travels and give England the first benefit of them; and in this manner to show him the gratitude of the nation.

"I do not doubt that underlying all this there was a strong dose of snobbishness, in which England excels, an aping of the great and the wealthy and the highly cultured, for I am certain that many of my entertainers had but very vague notions of Central Asia. Nevertheless, expressions of appreciation of my toils and labours, even if they were speculations upon ulterior benefits on the part of my hosts, could not leave me quite indifferent; in fact they took a most astonishing hold of me."

It was during a later visit that Professor Vambéry began to visit at Windsor Castle:

"My apartments were in one of the round towers of the Castle, so full of historical memories; and as I gazed at the lovely landscape, with the Thames winding in and out among the trees, and remembered the ideas I had formed of this royal castle when I read Shakespeare, I was deeply moved at the wonderful change in my position. If some one had told me in the days gone by that I, who was then living in the poorest circumstances, and even suffering hunger, should one day be the honoured guest of the Queen of England and Empress of India at Windsor, that men in high position would lead me through the ancient halls, show me the royal treasures, and that I should sit next but two to the Queen at table, I should, in spite of my lively imagination, have thought him a fool and have laughed in his face. The crown jewels never dazzled me to such an extent as to force me to worship their wearer. But every one must agree that the natural simplicity of Queen Victoria's manner, her rare amiability and kindness of heart, and the way in which she knew how to honour Art and Science, had a most fascinating effect on those who came into contact with her. It is a great mistake to imagine that this princess, placed at the head of the monarchical republic, as England may be called on account of its Constitution, was only the symbolical leader of the mighty State, having no influence on its wonderful machinery. Queen Victoria had a remarkable memory; she knew the ins and outs of every question, took a lively interest in everything, and in spite of her earnest mien and conversation, sparks of wit often lighted up the seemingly cold surface, and reminded one of the fact that she was a talented princess and a clever, sensible woman."

But perhaps most interesting of all are the recollections of the author as the most intimate occidental friend of the present Sultan of Turkey. Here the writer speaks with a frankness which perhaps would not have been possible had the friendship continued. He gives undoubtedly the best and most frank description of his Ottoman Majesty which the world has yet received upon trustworthy authority. Of the Sultan's personal manner he says:

"Once I was sitting with him till far into the night in the great hall of the Chalet Kiosk. It was the height of summer, and in the heat of the conversation his Majesty had become thirsty, and called to the attendant in the ante-room, 'Su ghetirin' ('bring water'). The attendant, who had probably fallen asleep, did not hear. The Sultan called twice, three times, clapped his chands, but all in vain, and when I jumped up and called the man, the Sultan said to him, almost beseechingly, 'Three times I have asked for water, and you have not given it me; I am thirsty, very thirsty.' With any other Oriental despot the servant would have forfeited his head, but Abdul Hamid's character was the most curious mixture imaginable of good and bad qualities, which he exhibited according to the mood in which he happened to be."

On another day and at another time the Sultan related to Professor Vambéry the following picturesque incident of his earliest personal relations with the English:

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"It was during a conversation about the advisability of an English alliance in the interests of the Ottoman State that the Sultan in the fire of his conversation told me the following: 'I was six or seven years old when my blessed father commanded my presence, as he was going to send me to one of my aunts. I found him in one of his apartments, sitting on a sofa in intimate conversation with an elderly Christian gentleman. When my father noticed me, he called to me to come nearer and kiss the hand of the stranger seated by his side. At this behest I burst out in tears, for the idea of kissing the hand of a Giaour was to me, in my inexperience, absolutely revolting. My father, generally so sweet-tempered, became angry and said: "Do you know who this gentleman is? It is the English Ambassador, the best friend of my house and my country, and the English, although not belonging to our faith, are our most faithful allies." Upon this I reverently kissed the old gentleman's hand. It was the Boyuk Eltchi, Lord Stratford Canning. My father's words were deeply engraved upon my mind, and so I grew up with the idea that the English are our best friends. How bitterly I was disillusioned when I came to the throne!'"

Cap and Bells

It is almost remarkable how the school of comic poets has fallen away from the wide estate it ruled during the middle years of the last century. Even the members of that generation who remain with us are for the most part mute, and the tinkle of the jester's bells sounds very faintly nowadays. In fact among the younger men there seems none occupying a place at all equal to that of Mr. Owen Seaman, the familiar O. S. of *Punch*. All the more gratefully therefore comes each succeeding volume of Mr. Seaman's works, and his latest, *A Harvest of Chaff* (Constable, 3*s*. 6*d*. net), is sure of a wide and hearty welcome. The little book is filled with lyrics, graceful, tuneful, and gay, and to these are added—with what the author calls the right of a fool to be serious at times—a few memorial verses written upon the deaths of Queen Victoria, John Ruskin, Arthur Sullivan, Cecil Rhodes, and Leo XIII. Most of the poems have appeared in *Punch*; but one of the most charming, dedicated to Austin Dobson, "after himself," appears here for the first time:

TO AUSTIN DOBSON

AFTER HIMSELF

(*Rondeau of Villon*)

At sixty years, when April's face
Retrieves, as now, the winter's cold,
Where tales of other Springs are told,
You keep your courtly pride of place.
Within the circle's charmèd space
You rest unchallenged, as of old,
At sixty years.

Not Time nor Silence sets its trace
On golden lyre and voice of gold;
Our Poets' Poet, still you hold
The laurels got by no man's grace—
At sixty years.

One of the best examples of Mr. Seaman's lighter satire is called:

THE LITERARY PARASITE

He lives within the public eye
Immune from all investigation
Of how he came to occupy
That eligible habitation;
I hear of no accomplished feat
From which he takes the rank of writer,
Yet almost everywhere you meet
The name of Mr. Bertram Blighter.

His novel, *'Neath a Woman's Spell*,
His book of poems, *Past Repealing*,
Those jeux d'esprit, *Half-hours in Hell*,
That trifle, *Round my Study Ceiling*—
All these are in a harmless vein
And leave suburban bosoms lighter,
But cannot possibly explain
The splendid vogue of Bertram Blighter.

No merely adventitious aid
Helped him to hit the social target;
His early life is lost in shade—
I think he went to school at Margate;
Cambridge has housed him at the "Bull,"
And Oxford only at the "Mitre,"
And so the praise is due in full
To just himself—to Bertram Blighter.

How does he do it? I respond—
"By sitting down with men of letters,
'Author,' 'Omarian,' Vagabond,'
He gets confounded with his betters;
A member of the great O.P.,
A fixed and resolute first-nighter,
In all accounts of such you see,
'We noticed Mr. Bertram Blighter.'"

At what he calls his "five o'clocks"
You may assist where genii jostle—
The newest Rage in Paradox,
The final form of Art Apostle;
His knowledge of his guests is slight,
And theirs of him is something slighter,
Yet virtue in a steady flight
Streams from them all on Bertram Blighter.

A moon amid refulgent orbs,
A bee among a bed of roses,

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Their light and sweetness he absorbs
And as his own elsewhere imposes ;
So, swarming up the rungs of fame
With ever surer grasp and tighter,
He bears his undisputed claim
To be " the well-known Bertram Blighter."

A Dane in Central Asia

Recent events in Tibet give special interest to an important volume of observation and travel, *Through the Unknown Pamirs : Vakhan and Garan* (Heinemann, 15*s*. net). This is an account of the second Danish Pamir Expedition by Lieutenant O. Olufsen, who was the leader of the former travel and exploration party to the same place. The results of the expedition are exceedingly rich from the geographical, archæological and ethnological point of view. As this is the first account of the country published, the book is likely to be of permanent value. Perhaps of most general interest are the descriptions of domestic economy as practised by these strange descendants of the Parthians. In his description of a home of the better-class people Lieutenant Olufsen says :

" These people build their houses of the simplest materials, and have little idea of decorating them or of keeping them in repair ; they seem always to aim at building them in one particular style ; their arrangements of detail are the same for the rich and poor. The hearth-room is everywhere alike in Vakhan and Garan ; indeed, the poor have only this one room in their houses, in which both man and beast consequently pass the winter together. . . .

" The roof of the hearth-room, like the roofs of the other rooms, consists of rafters covered with fagots and hay, with a layer of mud on top, and rests on four strong hewn wooden pillars, which are always ornamented with wreaths of ears of corn. The custom of crowning columns with flowers and branches is found in the Zoroastrian religion of the Parthians—or rather in the mixture of religion whereof this creed consisted. In a low-relief from the time of the Parthians is a Magian consecrating a holy column crowned with wreaths. As the Parthian realm embraced all Bactria, it is possible that the custom may have originated as far back as from that period. On the outer side of all the pillars are broad clay platforms three-quarters to one metre high, so that the space in the middle forms a square hole (*yârich*). In the platform to the right, in rare cases to the left, of the entrance is the hearth (*ghögöf*), which consists of a cavity in the platform ending at the top in a small vent for the smoke. In front of the platform is the fireplace, and below this in the floor are several ash-pits (*tökh*). The other platforms are divided into several stalls (*barkönjë*) by partition walls. They do not reach the ceiling."

The National Gallery

Since the invention of modern methods of photogravure and picture reproduction generally, many books have been published containing copies from masters, more or less great. But for the ordinary student of the world's masterpieces it is doubtful if any more serviceable volume has appeared than this book upon *The National Gallery* (Warne, 25*s*. net). It contains an admirable arrangement of the different Schools in the National Gallery, with handsome reproductions, and critical comments by Gustave Geoffrey—comments written so that laymen may appreciate and understand them. Sir Walter Armstrong contributes an illuminative historical introduction, bringing to the notice of the reader many facts not generally known. He tells in full the story how just eighty years ago Lord Liverpool, as Prime Minister, began the collection which has since become the most complete in the world. It is strange to read that the Premier's proposal was resented, curiously enough by certain eminent painters, among them Constable, who feared the effect that the presence of a fine collection of accepted masterpieces might have upon the contemporary school of art. It is an interesting story, this story of the National Gallery, and is fitly placed in a volume which brings to the reader so many copies of its treasures.

Improving our Cities

In his treatise upon *City Development* (Edinburgh : Patrick Geddes and Colleagues, 21*s*. net) Professor Patrick Geddes addresses an interested audience upon a subject which has, through various influences, become a timely one. The title is underlined *A Study of Parks, Gardens, and Culture-Institutes*. It is really a report to the Carnegie Dunfermline Trust, and embraces the author's ideas and theories upon the subject of municipal improvements. Professor Geddes gives many examples of the transformation of slum and unattractive streets into artistic prospects, satisfying both utilitarian needs and æsthetic ideals. He also devotes interesting chapters to museums and institutes, particularly those relating to ethnological studies concerning the dwelling-places of man in various times and climes. The book is filled with attractive illustrations, of which we are able to give one, and will well repay the perusal of the constantly increasing army of citizens interested in social betterment.

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A Master Fictionist

If one should say that a novel by Mr. Hall Caine was the chief event of a literary season there would doubtless be objection taken to the statement. But to say that the appearance of such a book is the chief event of the publishing season is clearly indisputable. When a book appears simultaneously in nine countries in five languages, when it sells in England and America alone something like two hundred thousand copies on the day of publication, when newspapers and literary journals the world over devote pages, and issues even, to its discussion, surely its author is a man to be seriously reckoned with, seriously considered, as a master writer to the world at large. Mr. Caine does not make himself common. No semi-annual appearance for him. Two and three years elapse between each succeeding volume, and this fact no doubt whets the eagerness with which the multitude of his readers awaits a new novel. Therefore in the whole history of publishing it is doubtful if any one novel ever was cause for so many and such varied ramifications of activity as took place on November 4, over the appearance of *The Prodigal Son* (Heinemann, 6s.).

As its title indicates, Mr. Caine again deals with what may be called the simple humanities. But he does not, as the title might indicate, tell the story of the parable. Rather he follows the line of adapting religious teaching to modern necessity, and shows how conclusively he is of the opinion that the Biblical story is impossible as applied to latter-day life. One might say that Mr. Caine replaces Christ's doctrine of forgiveness for the prodigal with the stern morality of the Old Testament, which measured out punishment relentlessly in proportion to sin. The prodigal son in this story finds no forgiveness at the hand of his guiding fate, neither does he gain any sympathy whatever from the reader. Almost from the beginning he follows the direct path leading to that death which the author holds to be the only possible wages of sin. Oscar Stephensson treads the full measure of the downward path. There is no cardinal sin he seems to leave undone, for he was indirectly the cause of the death of his wife, and therefore murderer as well as forger and cheating gambler. That in the end he assumed to have secured the forgiveness of fate as far as this world is concerned, and reached a higher summit of material success than his early character would have led one to expect, counts little in the light of his terrible awakening to his true character as viewed by the simple people of his homeland, or the desolate misery of his awful death at the close.

The scene of the story is laid in Iceland, which strikes one as not at all unlike that primitive Isle of Man wherein Mr. Caine achieved his first (by some considered his greatest) triumphs. The Governor of Iceland has two sons —Magnus, heavy, almost dull, but very honest; Oscar, handsome, superficially brilliant, and thoroughly dishonest. The leading merchant on the island has two daughters—Thora, simple, virtuous, faithful; Helga, fascinating, very handsome, and wholly bad. This quartette work out the story. Thora is affianced to Magnus by the old people while they are yet children. Just before the wedding Oscar returns from school abroad, with all the glamour of foreign travel and training added to his natural attractiveness, and promptly steals away the heart and finally the hand of Thora, whom Magnus adores yet surrenders, though he faithfully serves her as long as she lives. The new marriage does not take place before Thora's younger sister returns from school, and her appearance discloses both to herself and Oscar that she, not Thora, is his fitting bride. It requires little foresight to see that with these relations existing between them, with their eyes fully open to the situation, the long wedding journey on which Helga accompanies her sister and brother-in-law should not be a happy time for the trusting, simple little bride. But their neglect of Thora is not their only crime, for through heavy losses at Monte Carlo the two combine to forge the name of Oscar's father, Governor of Iceland, to an extent which inevitably brings the old man to complete ruin. Even this crime seems less heartless than the way in which Helga brings about the death of her sister by circulating stories of her madness, and causing her first-born to be taken away from her. Mr. Caine has never written a stronger or more moving scene than his description of the flight of Thora after her lost child, or her return with it to the scene of its birth:

"Clinging to the little one with feverish arms she hastened along, weeping to herself, laughing to herself, full of a wild joy that had no remorse, no qualms of any kind, and neither looked before nor after. It was motherhood, the most divine, the most devilish, the most tender, the most terrible, the most sweet, the most sublime, the most savage of all the passions of the heart.

"Reaching home at last she found the house silent, but every room wide open as if lately ringing with the noise of hurrying feet. Creeping

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upstairs with her precious burden she got safely back to her room, and instantly locked the door behind her. She laughed as she did so, thinking how Anna and Aunt Margaret would follow her and find themselves defeated.

"Then she undressed and got back into bed, and for one long heavenly hour she gave herself up to the delight of having her child—to hold it, to nurse it, to fondle it, to kiss it, and to devour it with all her senses. The little creature had slept during its journey through the town, but now it awoke, and lay quiet by its mother's side while she ran her hungry hands over its tiny body, and put its clenched fists and its feet one by one into her mouth.

"After a while the child tired and began to cry, whereupon Thora remembered for the first time that she had left its feeding-bottle behind her. She tried to hush it, but it would not be hushed; and then a sudden thought, a blind impulse of maternity, came to her, and she put the little one to her breast. The child clung to it and was quiet, and the milk, which had never come until now, instantly began to flow.

"It was the crowning miracle of that joyous hour, a physical rapture such as Thora had never known before.

"After that a more tender spirit stole over her, and she looked lovingly down at the child in her bosom and kissed it again and again, more and more, and said, 'God bless my baby.'

"Then, in a voice so weak and silvery that it was like the voice descending from the sky, she began to sing the child to sleep:

'Sleep, baby, sleep,
Angels bright thy slumbers keep,
Sleep, baby, sleep.'

"The child slept, and even while she sang, Thora became aware of alternate waves of heat and cold going over her. A vague, broken, delirious consciousness came and went, and people seemed to be entering and leaving the room.

* * * * *

"When she came to herself again it was dark in the bedroom, yet she was still singing. The baby began to cry, and she wished to comfort it, but she found she could not speak. Its little body felt cold against her breast, and she wanted to cover it up in the blanket, but her arms were heavy and she could not lift them.

"There was a moment of agonised consciousness, but the good Father sealed the senses of His suffering child again. She thought a majestic figure entered the room, clothed all in white, and lifted the baby out of her bosom, saying, 'Suffer little children to come unto Me.' She knew quite well Who It was, but when she looked a second time the figure had the face of Magnus.

"Then it seemed to her that it was she herself and not the baby that had been lifted up, yet she felt no fear at all, nor any pain, nor any heartache.

"At that moment the women who stood about the bed came back, and they began to sing 'Safe in the arms of Jesus'—just as she had heard them singing it when she listened at the door of the Shelter.

"She smiled and drew a deep sigh, a sweet long breath of joy and rapture; and then the darkness lifted and—it was Day."

In Iceland the story moves on simple lines, and is almost pure tragedy. When it comes to England or the Continent it somehow changes into frank melodrama, none the less moving on that account, for all the world loves good melodrama. The scene on the Riviera, where for the love of Helga Oscar consents to cheat at the gambling tables, will surely be one of the strongest scenes in a dramatised version of the book. And when this cheating is discovered, when the frequenters of the place demand Oscar's punishment, it is a melodramatic stroke of great cleverness which announces his death by suicide, leaving him in reality free to begin a new life under a new name, and to gain great honour for himself and for his native land.

It would not be fair to the book to give the full story of the unravelling of the tangled skein of Oscar's life. With his return to Iceland the author strikes and sustains a note of moving power, which cannot fail to leave the reader impressed with a sense of his mastery in his art, and his sincerity of purpose. The closing scene, after one has passed over the horrible disappointment and rejection of the returned wanderer, is one of great beauty:

"Oscar Stephensson did not see or hear or feel anything. He was only conscious of a burst of heavenly music, of a sense of ten thousand angels singing an anthem, a triumphant pæan of praise that grew louder and louder every moment; a sense of blinding light, and of travelling at a terrific velocity into the realms of the sun; a sense of the Day of Judgment, of the life of the world being over, its busy throngs gone, its pageants finished, its honours, distinctions, castes, gold, wealth, and fame passed into nothingness; a sense of being outside the great Judgment Hall with an infinite multitude of kings and beggars, good men and bad, the guilty and the innocent, and of kneeling there among the meanest and most ashamed; a sense of a spirit stooping to him and taking his hand and saying, 'Come,' of looking up into her face, and seeing it was Thora, and of his breath coming so fast and short that he could scarcely breathe; a sense of stumbling along with his head down, and the spirit

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leading him forward and singing as they ascended ; a sense of an overwhelming Presence somewhere in front of him, of the music dying down and becoming fainter and fainter, and then of an awful hush, and of a blessed Voice which said :

" ' For this my son was dead and is alive again, was lost and is found.'

* * * * *

" A moment afterwards there was no one on Hengel mountain ; the great lone home of Nature was calm and white, and silent."

Holiday Stories

An interesting experiment in literary collaboration is a little book written by Mrs. Kate Douglas Wiggin and three of her friends, called *An Affair at an Inn* (Gay and Bird, 3*s*.6*d*.). Each of the four writers assumes a character, and each gives an individual version of the various circumstances surrounding a Scotch-American courtship at a Devonshire inn. It is hardly necessary to say that Mrs. Wiggin, in the character of the attractive American girl, is by far the best of the quartette ; but the others are not bad seconds, and the little book is safe to give to any one a pleasant hour's reading.

There is a tender touch in the work of Mr. John Fox, which made his " Little Shepherd of Kingdom Come " one of the most successful of last year's books on both sides of the ocean. Among the same people, the rough mountaineers of Cumberland, lie the scenes depicted in his *Christmas Eve on Lonesome* (Constable, 3*s*. 6*d*. net). This is in reality a collection of short stories, but they are all of a character, and with delightful illustrations in colour the book is an excellent prize for holiday purchasers.

For Practical Presents

Messrs. Cassell and Co., who have a speciality for this class of books, send us three works upon mechanical and scientific subjects, each of which would be an ideal Christmas present to a youth who loves tools and workshops. The scientific work is *Electricity in the Service of Man*, by Dr. Mullineux Walmsley. It is a remarkably complete account of the development of electrical knowledge, beginning with the bar magnet and ending with polyphase watt-meters. Part of each section is too mathematical and technical for the most thoughtful boy, and indeed is only intended for the early education of the expert, but very much of it is within the grasp of any youth who deserves to have it given to him, and the fact that a good deal of it would be far beyond him would act as a spur to his interest and study. It contains an elaborately illustrated account of every modern electrical apparatus and invention, and with its 1208 pages, and its 1200 illustrations it is remarkably cheap at half a guinea. The other two volumes are edited by the indefatigable Mr. Paul N. Hasluck, whose name is a household word among amateur workers. One is *The Handyman's Book of Woodworking*, descriptive of all the tools, materials, and processes employed in working with wood, 760 pages and 900 illustrations for 9*s*., and a companion volume on *Metal-working*, with 768 pages and 2206 illustrations for 9*s*. The wider the circulation of such books as these, the better for us as intelligent individuals and an efficient nation.

We also receive from Mr. John Murray an especially valuable book of this class, *The Home Mechanic*, by John Wright (12*s*.). It treats in an admirable manner of tools and methods in both woodworking and metal-working, and will prove an elementary education in practical mechanics to any youth who goes through it. The author explains that he has written it because when a boy he experienced the greatest difficulty in obtaining information on many of the simplest pieces of work, with the result that he adopted " dodges." Now he knows that " dodges " are worse than useless, and that " the only way to become a good workman is to begin quite at the beginning.

Eton College has shown signs at last of waking up to the fact that education is something more than the ability to write mediocre Greek and Latin verse, and two thin volumes before us, *Eton Nature Study* (Duckworth and Co., 3*s*. 6*d*. each part) by Mr. Hill, Assistant Master, and Mr. Webb, Lecturer on Botany, for the Surrey County Council, are a welcome example of the fact. They consist of a series of " observational lessons " in nature-study, dealing with a very large number of natural objects, lavishly illustrated. They are intended to train the observation and inform the mind, to cultivate the emotional sense and add to the pleasure of life. It is, in fact, an antithesis to the " information lesson." An intelligent parent or a modern teacher will warmly welcome these admirable little volumes.

Mr. Edward Brown is the leading poultry expert of this country, and his *Poultry-keeping as an Industry for Farmers and Cottagers*, is the best book of its kind for its purpose. We may therefore merely record the appearance of the fifth edition (Edward Arnold, 6*s*.), and recommend it cordially to all interested in the important and useful subject of which it treats.

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MAN AND MUSCLE

STRENGTH WITHOUT MUSCLE—HOW A MAN WHO HAS HAD NO PHYSICAL TRAINING CAN PERFORM MARVELLOUS FEATS—MUSCLES ARE BORN, NOT MADE—HERR GEORG LETTL'S PERFORMANCES—THE IMPORTANT PART PLAYED BY WILL-POWER

BY

A PHYSICIAN

THE invitation to go and see an exhibition of "strength without muscle" was welcome to the writer, who is well aware that no man without muscles ever breathed—the word is used advisedly—and who also admits the contention of modern psychology that every act of volition, including even the act of attending to a given subject, is a muscular act, even if the muscular tissue be only in the walls of a blood-vessel.

Now Herr Georg Lettl's performances at the Hippodrome do depend, as a matter of fact, on the possession of a very fine muscular development; he certainly could not otherwise be the holder of the world's record for heavy lifting. But Herr Lettl is an interesting study none the less. To begin with, he is approaching his fortieth year. His height is only five feet four inches; his weight only *ten stone;* and his appearance suggestive of the student or clerk, rather than the athlete. His bones are quite small, the lower jaw being almost as slender as a woman's. After a pretty thorough examination, one was quite prepared to accept the statement that he does not train and never has trained. Finally, there is the positive fact that, though his arms and shoulders are well developed, the actual dimensions and bulk of his muscles are definitely very much less than those of men who have only a fraction of his strength.

Herr Lettl thus raises two interesting questions, to each of which I believe that I can afford an answer. In the first place, why should a small man, small in stature and in girth of bone, living a non-athletic life, be the possessor of such a fine muscular development? Why does the young lion-cub, born and bred in the Zoological Gardens, develop such superb muscles without any exercise? Why does the present writer, on the other hand, despite his devotion to thletics and his unfailing appetite, never develop a single muscle of even the average size? The truth is that for each individual there is a natural limit to the size of his muscles. Every muscular fibre in the body depends for its nutrition upon the health and activity of a nerve-cell in the brain or spinal cord. Now a nerve-cell, unlike any other, is without the power of division. Half a century of thought will not add a single one to the original number of nerve-cells with which a man was endowed at his birth. Consider then, the case of your biceps muscle. In a well-defined area of the spinal cord are the nerve-cells upon which its health and size depend. If these cells be numerous and active, your biceps will be large and firm, whether you exercise it or no; and no amount of exercise can do more than develop it up to the limits imposed by the number of nerve-cells which control it. No system, therefore, can turn every man into a Sandow or a Lettl; since no system can add to the original numbers of the nerve-cells upon which the development of muscular tissue depends.

But the second question raised by Herr Lettl is much more subtle. How is it that he is enabled, with a given amount of muscular tissue, to accomplish feats impossible for men with much larger muscles? The first explanation that presents itself is the possession of superior knack; for we remember the feats of the little Japanese wrestlers whom even a Hackenschmidt is not prepared to meet. But Herr Lettl's feats do not belong to this category. His lifting of an anchor and four men, weighing altogether 1500 pounds—400 pounds heavier than any previous lift on record—is done in the ordinary way and is not susceptible of any treatment by "knack." The explanation is more remote and more interesting. Again we are thrown back upon the real seat of all action, the nervous system.

The amount of work done by a muscle of

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given size depends upon the amount of energy put forth by the nerve-cells whose servant it is. This can be easily illustrated by what the physiologist calls a "nerve-muscle preparation"; the work done by the muscle is proportionate to the strength of the electric current applied to the nerve. We know in common life that many a frail man or woman, under the influence of some ideal or necessity, gets through an amount of work which seems incredible. In other words, we are here face to face with the psychological problem of *will*. Mental disease gives us many illustrations. In certain cases of enfeebled will, big muscles prove impotent; in other cases, of mania and the like, the most amazing muscular feats, utterly impossible to the patient when in health, can be performed, as a result of an abnormal heightening of will-power. So I infer that Herr Lettl's feats may really be looked upon as feats of will rather than muscle.

But I cannot let pass this opportunity of referring to a function of muscle with which few are familiar; a function almost as interesting as is the unfamiliar function of bone. We think of bones as practically inert, dead structures which serve to support the living tissues. Few know that the cells of their blood are constantly being manufactured *inside their bones*. No tissue in the body is more alive or more ceaselessly active than the bone-marrow. Similarly the obvious function of muscle is supplemented by another of equal importance. We need be under no delusion that when man has completely chained the forces of nature, and made them work for him, the muscles will then be superfluous. The muscles are the fireplaces of the body. Unless our temperature is kept up to the normal we soon become incapable of any vital activities whatever; and it is the muscles which supply the greater part of the indispensable heat of the body. It thus follows that even if everything save our breathing and the beating of the heart be done for us, it is still essential to our life and health that the muscles be kept up to a certain level of activity. This, in these days of motor-cars and lifts, is perhaps the chief function of physical exercise.

THE NATIONAL IMPORTANCE OF PHYSICAL EDUCATION

PERFECT HEALTH, NOT LARGE MUSCLES, IS THE REAL OBJECT OF PHYSICAL EDUCATION—ALL POPULAR METHODS ARE DEFECTIVE—IN THE IDEAL SYSTEM COMMON SENSE IS MORE IMPORTANT THAN "SCIENCE"

BY

W. MACDONALD SMITH

"THE smile seems to have left the faces of adults," said a friend to me the other day. If this be true—and who will question it?—no thinking man can have any doubt as to the national importance of physical culture, if only to restore that happy proof of well-being which out of England still exists on many adult countenances. Its enormous importance is obvious, for as Emerson says, "the true test of civilisation is not the census nor the size of cities, nor the crops—no, but the kind of man the country turns out"; we want men with alert and cheerful minds, courage, the best mental, moral, and physical qualities, all of which characteristics an ideal system of physical culture, when found, will be able to impart.

But it is one thing to acknowledge that the matter is all-important; quite another to create an ideal system which shall meet the needs of the nation, and a third and totally distinct and most difficult step to get such a system appreciated and adopted. Now, not only is it hard to take these three steps in their proper order, but the difficulty is intensified by attempts constantly being made to take the third before the second. Indeed, one of the principal reproaches merited by well-meaning "reformers" of our social state is that they seldom go to the root of things, seldom seek for true causes, and, constantly ignoring fundamental principles, try to "organise," advertise, and force upon the public multitudes of paltry little "improvements"

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which are, in reality, no improvements at all; because they accomplish next to nothing in the way of alleviating evils whose roots are far deeper down than average "faddists" are capable of digging. Especially true is this of diet, health, and physical education generally. The foundations on which a science of physical education may be built appear not to be studied by any one, certainly not by most of those whom the public consider to be authorities on the subject. Should the objection be made that, although the work of most gymnastic teachers is unscientific, there are numbers of physiologists in the highest degree scientific, and who could easily set the matter on a firm basis and create a science of physical development, I reply that even should they do so they will not become authorities on physical culture. As far as I have known them personally, and read their works, scientific physiologists are brought up in the medical profession, and the great difference between the medical man and the ideal physical educator is that the latter has to look upon human development from the standpoint of health, whereas the medical man is continually forced by the public to look at it from the disease standpoint, and there is as much or more difference between the two as between the ways in which a plaintiff and defendant receive a witness's evidence.

The intelligence of the public has not got beyond arguing that, because a perfect man has large muscles, you have only to develop the muscles of an average man to perfect him physically. There could not be a greater fallacy. Promptitude and grace are very much more closely connected with that perfect health which we aim at than large muscles. Without wishing to decry in the least the value of the work done by Sandow in creating the interest that undoubtedly exists in physical culture, one cannot help seeing that in his own person he manifests the truth of this assertion. His powers are a natural endowment, whatever exercise he may have used to modify them, but any one who witnessed the competition at the Albert Hall between men highly trained on his system must agree that not one of them approached him in anything but mere size of muscle. He was the only graceful man in the show. It does not follow that because a man's muscles are large his heart and mind are large also, neither does it follow that because he is physically strong his character and nerves are so too. Perfect nerves and characters are what we want in this life, rather than physical strength. The higher part, the strong part, of man is not his body, but his intellect and soul: man was never meant to be a cart horse. If I see a navvy lumbering home after his hard day's work, I cannot help looking upon him as a pitiable product of a misguided society, or rather, of a society yet in its infancy. Everything points to the fact that in the future all really hard labour will be done away with by the use of labour-saving machinery and appliances. This does not mean that the necessity for developing the body will grow less; far from it. The physical culture of the future will be a very advanced one, but very different from what we are now accustomed to, the appropriate device of which is a man contemplating his huge biceps. Machinery for all purposes of life will probably become so complex that the user of it will require the dexterity of a "virtuoso." Great physical strength will not be needed for any part of the world's work, it will often be deprecated as too often going hand in hand with clumsiness. Your weight-lifter with his huge muscles cannot do without a certain amount of "connective tissue," very detrimental to that healthy elastic condition of the true "muscular tissue" required for rapid control of movement; neither can a man do very hard physical work without creating poisons which, unless exceptional means are taken for their elimination, will benumb both nerve and brain. In a word, the winner of the race for life, in the near future, will be the one who has perfect control of nerve and muscle: who is calm but quick, clear-brained and supple of limb. And from the higher point of view, the body will be developed for the use of the soul.

Again, assuming for the moment that physical development is synonymous with muscular development, which it is not, much ignorance is shown both by teachers and the public. It is assumed that because workers have large muscles, one must use weights and do work in order to get the best muscular development. The fallacy of this idea is amply proved by the continuous lightening of dumb-bells until they are getting to survive only in the form of a light wooden bell the purpose of which its users would find it difficult to define, though they still retain their grip on the fetish.

I may perhaps be considered in a position to know something of what "authorities" think on the matter of physical education, for, in 1900, I attended the large Paris Congress on the subject, at the end of which I had the honour of being elected a member of the International Commission and made the delegate

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for this country. In Paris I met, and listened to speeches from, delegates from all countries, representative men who were authorities in their own lands, and really it seemed that scientific ideas on physical development hardly existed in the minds of nineteen out of twenty of them. The Congress consisted simply of a huge meeting of professors of gymnastics who discussed little beyond what was the best way to get people to work at gymnastics, or to decide which apparatus or other was cheapest and best. The idea that apparatus might possibly be advantageously dispensed with, or that there was any principle to be found for muscular development except that of using a muscle to do work, or that diet, air, repose, and games were equally important elements of physical education, never entered their speeches, and I suppose, therefore, never entered their minds. There were also a few "scientists" who, mistaking means for ends, were entirely centred on getting *graphical* representations of movements or of work done in certain exercises.

The result of such empirical procedure is that so far all popular methods are defective, and the public do not know of any system that even approximates to the ideal, the consequence being that the plan recommended by them is a patchwork plan which can only have a patchwork result; whereas, if there is one matter which above all others must be founded on scientific and general principles, and not on empiricism, it is the physical education of the nation. Experience is beginning to teach us that working the muscles alone is unsatisfactory, that the working of the brain alone is wrong, and that even the combination of these isolated methods is by no means successful. Is it not clear, then, that the next thing to do is to ascertain whether there is not some element common to all and underlying the perfection of muscles, brain, and digestion, the study of which would lead to perfect balance of all bodily organs in turn? Obvious as it seems, scarcely anybody recognises the fact that the free circulation of pure blood is the only necessary condition for the physical health of each and every organ, whether it be muscle, nerve, bone, or skin. Food we should study in order to get pure blood; exercise, that pure blood may be circulated; air, that blood may be purer and hold more oxygen; baths, that it may be rid of impurities.

It would be superfluous to try to point out the numerous defects of the various systems now in favour. Why should we not take a lesson from the Japanese, who attend to these things in a way that is little short of perfection, and who possess many splendid qualities which we lack? Or from Hatha Yoga, the system used by the Yogis of the East, for attainment of physical well-being, and as the basis of all perfection? It is true that the dumb-bell and developer system of physical culture has attained considerable popularity, but this is because, go where you will, methods as well as things are constantly performed and valued in proportion to the amount of human effort they have cost in their production or attainment. "Merely to have large muscles for show," says Mr. Eustace Miles, "and to go through a certain number of feats of strength, does not set a very high ideal of physical culture before the masses." Incomplete systems are inadequate and disappointing. Fundamental principles are wanted, without which a system can no more be satisfactory than can a business without a manager.

If we wish to develop the body satisfactorily, we must work on one or more general principles which will encourage the healthy growth of each and every part of it, including the brain and the nervous system.

The best system of physical education must perforce be that which most readily enables the individual to compass, even among the drawbacks of civilisation, a large measure of the happiness enjoyed by all who fare simply, breathe fresh air, give moderate exercise to their intellects, emotions, and their muscles. Hard gymnastics will never compass it. Such a system is not one of effort, but one of adaptation to the requirements of Nature, from whose beneficent laws we have strayed, and the only return is by the path of obedience to her behests. Let it not be said that such a system is impossible or even very utopian, or that it could never be adapted to the requirements of modern civilisation. Far from it: the process should be simplicity itself. Find out what are the necessary elements of right-living, classify them in their order of importance, and arrange them to form a course such as will be suited to the circumstances of almost any worker in town or country. This is quite possible. It is not so much "science" that we require for this as common sense—what seems, unfortunately, to be the most *uncommon* of all senses. Given common sense, given the ability to reason from cause to effect, and from effect to cause, the whole process is but a matter of a little careful thought, a matter of removing the obstacles that we have so far placed in Nature's path, and allowing her free play.

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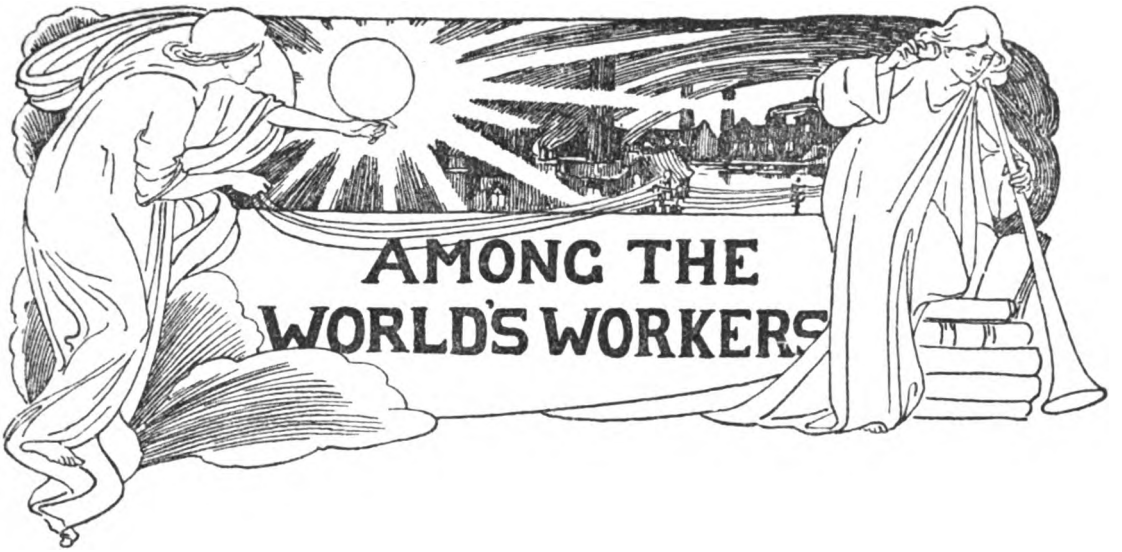

SUCCESSFUL ORGANISING IN THE FRUIT-GROWING INDUSTRY

A NOTEWORTHY experiment by the fruit growers of the Evesham district of Worcestershire to place their industry on a more satisfactory footing, especially in reference to marketing conditions, is described by a correspondent of the *Standard*.

The Evesham district represents a total area of about 9000 acres devoted to fruit and vegetable culture, the staple products being plums and apples, though large crops of gooseberries, currants, asparagus, &c., are gathered in besides. Upon the success or failure of each particular season depends the welfare of a considerable number of people, but experience in the past has shown that when only ordinary crops were gathered in, it was hardly possible for the growers to make a living out of the business. The primary reason for this fact was the defective system then in vogue for the marketing of the produce. The actual growers were generally too busy in the orchards, at the time of their harvest, to superintend personally the sale of the fruit that was plucked, and the practice grew up of their disposing of the crop to local dealers, who themselves sold to the wholesale merchants, from whom the shopkeepers would purchase the supplies which they, in turn, would offer to the actual consumers. What happened, therefore, with this series of middle men, was that profits which the actual grower should have secured, were swallowed up by others, and the small margin left for himself represented a totally inadequate remuneration for the one who had all the cost and labour of actual production.

To remedy this evil, a group of some of the largest growers in the district resolved, in the Spring of the present year, to resort to co-operative effort in establishing an organisation which they called the Evesham Growers' Association, Ltd., in affiliation with the Agricultural Organisation Society. The fundamental aim of this body is to reduce the middleman element to the smallest possible dimensions. To this end the growers constituting the combination send their produce to a central depôt, where the sale of it is arranged by a manager who, by telephone or telegraph, obtains orders each day from dealers in the large centres of population in the Midlands and the North of England, in South Wales, in Scotland, and also in Ireland, executing those orders direct, without the intervention of any agent. The manager also sends out a weekly price-list to shopkeepers throughout the United Kingdom, quoting the prices at which direct supplies can be forwarded to them, and a very good business has been developed in this way as well. Thus, during the course of the present fruit season, the Association has disposed of no fewer than 55 tons of fruit (30 tons of damsons, 20 of apples, and 5 of black currants) to the Wholesale Co-operative Society of Manchester, for the purposes of jam-making. Parenthetically, it may be remarked that not only is jam-making in itself an excellent thing for British fruit-growers in the direct profit thus secured, but the execution of orders such as those indicated by the figures here given relieves the general market of surplus supplies which, if thrown upon it, would tend to reduce prices all round.

Still further, the Evesham Society has organised a system under which it sends boxes of fruit direct to the consumer in return for charges which will include delivery. In this respect, the Evesham fruit-growers are emulating the example set by the fish merchants of Grimsby, who have worked up a big business in the sending out of direct supplies to householders. Every care will be taken also to secure a perfection of conditions In regard to freshness, grading, and packing. If, for instance, a box of apples is to be made up, this will be done in the orchard itself, the fruit

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being plucked from the tree and placed straight into the box, each apple properly graded, being wrapped up in a separate piece of soft paper bearing the Society's official stamp. Boxes of damsons, plums, tomatoes, &c., will also be available for despatch to householders, the average weight of the contents being either 40 lb. or 20 lb. Of apples of the Blenheim Orange variety it is expected that the supplies forwarded this season will be equal to 5000 cases of 40 lb. each, independently of cooking apples. As regards also the consignments for shopkeepers, the Evesham Association will seek to follow American lines in regard to grading and packing, thus overcoming the unfavourable comparisons which have been made in the past between British and foreign methods.

In their *rôle* as a trading Society, the members of the Association add to their own supplies by purchasing from local growers who are not themselves members. It is true that in the case of the latter they may not always get a better price than they would secure from the ordinary dealers, but they do, at least, make sure of their money, and they do not run any of those unpleasant risks, from which in the past the fruit trade has not been exempted. Altogether, the amount of fruit and vegetables (mainly the former) handled by the Association since it came into existence in the Spring is put at close on 1000 tons.

SERUM TREATMENT OF TYPHOID

AT the Medical Congress recently held in Paris, Professor Chantonet made an important statement with reference to the result obtained by his serum in the treatment of typhoid fever. The serum, he said, had been used continuously in one of the Paris military hospitals for three years and a half, and the mortality recorded was only 4 per cent. The average rate in the other Paris hospitals where the ordinary treatment was followed was 18 per cent. for the same period.

AN INSTANTANEOUS FIRE ALARM

THE dangers of fire would be greatly decreased if by some method the outbreak could be located before it had reached the stage at which it can no longer be readily extinguished. The Leslie Walker instantaneous fire detector, we learn from the *Morning Post*, claims to do this. The invention is based on the expansion of mercury when heated, just as is the thermometer. Two platinum wires, the one immersed in the mercury, the other a little above the surface, complete an electrical circuit so soon as the mercury expanded by heat touches the upper wire, and an alarm bell is set ringing. Each detector has its own wires leading to an indicator, so that the room in which there is fire can be immediately located. The instrument is so arranged that a slow rise of temperature does not affect it, yet it is so delicate in operation that at a test shown in the large concert room of St. Peter's Institute, Buckingham Palace Road, the bell was ringing within ten seconds of the rapid burning of a newspaper on the floor of the room. The detectors were fastened to the ceiling at a height of 25 ft. to 30 ft. The detector is already in use in several places in America and on the Continent, and at one of the masters' houses at Harrow School. It certainly seems valuable for large institutions, theatres, factories, blocks of offices, churches, and the like, and for large private residences. It is the property of a company, with offices in Hatton Garden, London.

SCIENCE NOTES

THE well-known electrical firm of Siemens and Halske, Berlin, have brought out a new telegraph which records the message in Roman letters by photography on a moving film like that of the cinematograph. An automatic sender worked by a tape in which the message is punched, sends high-tension currents into the line wire, which, at the far end, charge and discharge a condenser through a transformer, and excite an electric spark at the moment the eight letters on a revolving type-wheel is over the film. The light of the spark photographs the letter on the film, which is developed, fixed, and cut into lengths for delivery.

A BLACK lily or tulip with a flower eight or nine inches in diameter, has been found in the island of Luzon, in the Philippines. It emits an offensive odour which attracts flies, probably to ensure cross fertilisation of the flowers, and the leaves only appear after the flower, which rises from the bulb to a height of nine inches.

LIPPMANN discovered that coloured photographs could be taken by placing a mirror of mercury behind the plate so as to reflect the rays of light and produce colours by "interference," in the manner of soap-bubbles. M. Rothe has recently simplified the process by dispensing with the mirror. The rays of light are reflected from the surface of the air behind the plate, and ordinary cameras may be used. The red colours are somewhat hard to obtain at their true values, but he hopes to improve on the process.

LECITHINE, that precious nourishing principal found in yolk of egg and other foods, has been discovered in grapes, and the wine made from grapes by fermentation in the old way.

PHOTOGRAPHY has already done good service in the topographical surveys of high mountains, for example, the Rockies and the Himalayas, but it also promises to become useful in geological explorations. By means of kites with cameras attached, M. Wenz of Rheims has obtained good photographs of mountains showing the outcrop and formation of rocks, and M. Stanislas Mennier, a French authority, regards the method as practicable.

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ARSENIC IN THE BODY

THE researches of Professor Gautier have shown that most of the bodily organs contain a little arsenic, which is perhaps required by them, and is, moreover, present in much of our food-stuffs. He estimates that a Parisian takes 0.0003 grains of arsenic in his daily food. Fish and crustaceans are comparatively rich in arsenic; so is rock salt, water, and wine. Wheat bread, on the other hand, green vegetables and leaves, contain little or no arsenic.

DISINFECTION OF RAILWAY-CARRIAGES

BAVARIA is certainly in advance of the rest of Europe as regards hygienic measures on its railways. When a train arrives at a terminus, the carriages are all disinfected before starting on another journey. The doors and windows are all closed and a pan containing red-hot iron weights with a solution of *formaldehyde*, poured over them, is left in the carriage for seven hours.

INTERNATIONAL COMPETITION FOR INVENTORS

AN International Congress is to be held in Paris in June 1905, for considering what steps can be taken for guaranteeing the safety of workmen employed in electrical industries with high-tension conductors. The Congress is being organised by the Association of French Manufacturers for the Prevention of Accidents to Workmen, and a competition is opened with an award of £240 for the best apparatus, indicating clearly and precisely when and to what degree there is danger to a workman. The apparatus must be capable of adaptation to currents of various degrees of intensity, it must also be of absolute precision, and must not interfere in any way with the operator nor with the mode of distribution. All intending competitors or exhibitors should write to the President of the Association des Industriels de France, 3 Rue de Lutèce, Paris, before December 31. All the objects on systems exhibited will remain the property of the inventors, who must themselves protect their patents.

BORING THE LONGEST TUNNEL

PRINCE ROLAND BONAPARTE in a long article published by the *Figaro* gives a detailed account of the progress of the Simplon Tunnel. It was after the campaign of 1800, that Napoleon, remembering the experiences of his journey across the Alps, decided to have the Simplon road made between France and Italy. More than a hundred years later Prince Roland, the great nephew of Napoleon, attired in workman's clothes, has inspected the new tunnel which will, when finished, be over eleven miles in length, the longest tunnel in existence.

The boring of the mountain is being done at a greater speed than any previous work of this kind, by a hydraulic perforator of the Brandt system. When a sufficiently large cavity is formed the rock is blown out with dynamite. Up to the present time there have been 1,530,000 of these blasts. A passage is thus opened 6 to 7 ft. high by 7 to 10 ft. wide. The daily progress of the work varies from 12 to 27 ft.

The ventilation of the tunnel has been a great difficulty, and a still greater problem was the temperature, which sometimes rose to 40° and 42°. It has been found necessary to close the northern side with an iron door on account of the extremely high temperature.

On August 17 a terrible rock was struck which has greatly impeded the boring process, and on September 6 the workmen were again hindered by a spring of hot water. There were then only about 250 yards more to be bored, and if all things should be satisfactory it is expected that the boring will be finished by November 15. This part of the work was undertaken by Messrs. Brandt Brandan and Co. It was to be completed within five years and six months, for the sum of £2,800,000. On account of various unforeseen impediments an extension of time has been granted. About 1000 workmen are employed, and most of them are Italians. The Italian Government has deputed a Consul to watch over the interests of its subjects. Schools have been opened for the children of the workmen and an excellent hospital installed. There have been twenty deaths in all since the commencement of the work, and only eleven of these have occurred in the tunnel.

The men work for eight hours and are then relieved by others. The hours are from six to two, from two to ten, and from ten to six.

The tunnel is in a straight line, except for a slight curve at the two extremities. The workmen are conveyed to the relief of their comrades in trucks drawn by a steam-engine. Prince Roland speaks of this enterprise as "one of the great pacific conquests of man over nature." He maintains that such conquests are infinitely superior to the triumphs obtained by massacre on battle-fields, and he makes an appeal for the humble artisans working underground.

"In the future," he says, "may all nations substitute such conquests as these for the triumphs of war."

ALCOHOLISM AND HYPNOTISM

IN Russia alcoholism is being treated by hypnotism. The Russian Government has established dispensaries in St. Petersburg, Moscow, Kiev, Sarator, Jaroslar, Astrakhan,

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and other cities, and inveterate drunkards are flocking there by hundreds in order to put themselves under this treatment. It appears that the results are most satisfactory.

A NEW STONE FOR DECORATING

A NEW stone, known as *gallalithe*, or "milk-stone," is now being much used, and seems likely to take the place of marble and celluloid for many purposes. It is of about the same strength as horn but more brittle, and it can be easily manipulated if plunged for ten minutes into cold water, and afterwards from five to ten minutes in boiling water or petroleum heated from eighty to one hundred degrees. While warm this gallalithe will take impressions, so that it is excellent for decorative purposes, and it can be polished like horn. Another advantage is that it can be welded with glue on to wood or metal, and veined with colour. It is obtained chiefly from Vienna, and other parts of Austria.

A NEW ANEMOMETER FOR AERONAUTS

ONE of the great difficulties with which aeronauts have to contend is that they have no semaphore for indicating the weather. Before starting on an expedition it is customary to send up small pilot balloons, but while these will show the general direction for the journey they give no precise idea of speed. Balloons which are provided with a steering apparatus usually travel in a comparatively low altitude. The Lebaudy balloon rarely rises to a greater height than about a hundred yards, and M. Julliot has just been making very satisfactory experiments with a captive balloon provided with an apparatus of his own invention for calculating the speed and direction of the wind at various heights. M. Julliot is M. Lebaudy's engineer, and his captive balloon is installed in Moisson Park. It is provided with a register for marking the altitude, an oriflamme, and an electric light, so that it can be seen day and night. By means of this anemometer a pilot can tell precisely how to steer, both for his outward and homeward journey, according to the atmosphere.

SUPPLYING GAS FROM COAL-MINES

IN several parts of France it will soon be necessary to sink mines of a very much greater depth than hitherto, as the coal nearer the surface is exhausted. As the expense of sinking such deep mines is very considerable, the subject has given rise to much discussion. At a recent meeting of the Society of Mineral Industry, M. Beau, a mining engineer, proposed a plan for solving the difficulty. His idea is that the combustible should be transformed into gas, and distributed direct from the mine to consumers in the neighbourhood. Some objections were raised by the Society, as it was thought the danger of explosion would be great and that the expense of all the preliminaries would be enormous. M. Beau will probably give further details shortly of his scheme.

AGRICULTURAL SCHOOLS FOR WOMEN

IN a long article in *La Quinzaine*, the subject of agricultural schools is discussed. The writer states that Austria is far ahead of the other European nations with its agricultural schools for women. As far back as 1873, the Educational Council petitioned that there should be a kitchen-garden, a nursery-garden, and bee-hives in connection with every school. Vienna, at present, has in its environs no less than fifty-seven "school gardens," and in Lower Austria there are twelve hundred of these. In Switzerland every farm is a kind of school where a large trade is done in butter, cheese, and cream.

In Germany, where there are a million and a half more women than men, agriculture is largely taught with a view to colonisation. At the Berlin Congress of 1897, Madame Kastner, the Directress of the Friedenau Agricultural College, urged the necessity of trying "to idealise the love of the soil." The writer of this French article devotes two pages to an account of the English Agricultural College of Swanley for men and women. It appears that the first horticultural school for women was founded in 1889 in Russia, by the Baroness Budberg. It has been so successful that it was necessary to enlarge it about four years ago. In Germany there are several of these schools.

In France great attention is given to dairy-work. The Coëtlogon College was founded in 1886, near to Rennes, at the request of the Rennes Chamber of Commerce, and it is supported by the State, by the department of Ille et Vilaine, and by the city of Rennes. The State subscribes 9700 francs, and the department 2500 francs. The idea is that the pupils who have been thoroughly trained at the College in every branch of dairy-work shall be put at the head of dairy-schools throughout the country, or they will be in a position to take good situations in any agricultural enterprise for which they are qualified.

There is another of these dairy-schools at Kerliver in Finisterre, another near to Caen, and one or two other less important ones.

A FLOATING EXHIBITION

A SURPRISING experiment in methods of securing foreign trade which has just been started in Seattle, Washington, will be of equal interest to traders in this country. The idea occurred to Mr. John Rosene, who is known

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along the Pacific Coast as a daring and successful promoter, that, if merchants find it advantageous to display goods to visitors at such exhibitions as the St. Louis Fair, it might be profitable to send exhibits to people who cannot visit a fair. Presently, he had worked out a plan for an exhibition ship, to be fitted out with exhibits and despatched to make visits to the important seaports of the Orient.

The war in the Far East precluded a voyage this autumn. But already fifty of the hundred exhibitors needed to make the plan a success have engaged space for the initial trip next November. Accordingly, if nothing interferes with the project meanwhile, the steamship *Victoria* will sail from Seattle next year, to make a round of the ports from Yokohama to Sydney, returning *viâ* the west coast of South America and Honolulu. The ship will remain from two to ten days at each city. United States consuls will be invited to publish word of its coming in advance, and agents will be present to meet the foreign merchants who come aboard, and to distribute catalogues, take orders, and establish foreign agencies. None of the goods carried will be sold.

There will be a rush of the commercial nations for Oriental trade as soon as the war is over. The exposition ship is expected, by its very novelty, to seize an advantage, among the first, for its projectors.

HOW FURS ARE MADE

A VALUABLE report on the products, methods of manufacture, and mining resources of the province of Ssŭch'uan has been drawn up by Consul General Hosie and is published as official Paper "China No. 5, 1904," price 1*s.* 10*d.* The province is "the largest and probably the richest of the Empire of China." and Mr. Hosie's exhaustive report should be of great value to the commercial community. In the section on "Skins and Furs" he describes how the skins are cured and the furs prepared for clothing. The skins are first cleaned. They are carried outside the city walls to running water, and packed in large wooden tubs into which is poured a decoction made by boiling in water the pods of *Gleditschia sinensis.* After being well soaked in this soapy infusion river water is added, and they are washed and all grease and dirt removed. They are then taken from the tubs and well rinsed in the river. This process is repeated with fresh soapy water. They are then conveyed to the curing-houses, where they are packed in large jars containing a solution of sulphate of soda and water and the flour of rice ground with water in the ordinary Chinese stone mill. The amount of soda depends upon the weather. In the hot months 50 to 60 catties per 100 skins are required, against 70 catties in winter. The solution of soda and a bushel (40 lbs.) of the wet rice-flour having been mixed in the jar, each skin is taken separately and placed in the liquid compound. There the skins are allowed to steep for six or seven days in hot and twelve days in cold weather, when they are removed and the fleshy sides well scraped and cleaned with a knife. After this they are replaced in the same jars, but another bushel of wet rice-flour is added for each 100 skins. This second steeping occupies some twenty to thirty days, according as the weather is hot or cold. They are then removed and dried. Each skin is afterwards taken separately, damped on the raw side by sprinkling cold water by mouth, again scraped by knife, and hung up to dry. The cure is completed by beating each skin with a whip to remove the rice-flour and sulphate of soda. Tiger and leopard skins are steeped ten days longer, and rabbit (tame) skins, being thin, have the superfluous flesh removed by hand not by knife; but all other fur skins are cured as above. Monkey skins are made into leggings and breast-pads, and worn as a specific cure for rheumatism. The breasts of the lynx are favourite furs for jackets and robes, and in making them up the black spots are first plucked out.

HOW ONE MAN INCREASED HIS NATION'S CORN CROP

THROUGHOUT the Corn Belt of the United States, Professor P. G. Holden is known as the man who, more than any one else, has improved seed corn so that America's greatest crop has been increased by millions of bushels. The work began twenty years ago, when Professor Holden, then a college student, was teaching school in the summer. His pupils were all children of farmers. He heard the parents talking about poor corn crops and about crop failures. He wondered what he could do to improve the yield.

One day he asked his class, "How many hairs are there on a rat's tail?"

One child said "ten." Another said "fifty." A third said "a hundred." No one knew.

"How can you find out?" asked the teacher.

"Look in the dictionary," said one.

Finally a boy held up his hand, and said, "Teacher, I'll catch a rat and see."

"That's the only way," said Professor Holden.

That night there was a general rat-hunt in the Michigan village, and the next day every child shamefacedly reported that there were *no* hairs on a rat's tail.

This experience taught the pupils to investigate and to observe. Next, Professor Holden asked every child to select an ear of corn from his father's crib and bring it to school. The pupils brought the corn. The teacher graded it. The child whose corn was the poorest went home and told his father. The parent after remarking,

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"What does the teacher know about corn? He is paid to teach arithmetic," came to see the teacher. When he saw the ears of corn that were fuller and richer than his own, he realised that the teacher was right.

Professor Holden then asked all his pupils to plant three seeds of the best corn in a box, and water it. The boy whose father had the finest ear was among the most enthusiastic. The children nursed the corn carefully. The result was a crop packed with large kernels. Then the pupils' fathers became interested, and planted special seed corn. There were no more failures of corn crops.

Professor Holden became Professor of Agriculture at the Illinois State Agricultural College, at Champaign. He remembered the lesson of the Michigan farmers. In a year, through his efforts, the Illinois farmers were careful about sowing the best seed corn, and soon the farmers in Iowa and in Missouri, and, in fact, throughout the great Corn Belt, were becoming experts in seed corn.

Near Bloomington, Ill., is the 25,000-acre farm of the Funk brothers, the largest in the United States. Twenty thousand acres are devoted to corn. One day Professor Holden was visiting the farm. "What is your average yield?" he asked. "Forty to fifty bushels," he was told. "But it should be more," he said. He showed the Funk brothers how to select the best seed corn and to plant it carefully.

On a 20,000-acre farm, an increase of five bushels an acre a year meant a small fortune. Professor Holden became director of the farm. From some acres he raised seventy bushels an acre. The increase in yield the first year was 10,000 bushels!

This year Professor Holden preached the gospel of corn to the Iowa farmers from a special train. As a result, millions of bushels of corn have been added to the State yield. The work which began with a class of farmers' children in a Michigan country school is now effecting an improvement in the methods of agriculture throughout the United States.

THE LIFE OF A SOVEREIGN

THE life of a sovereign before it becomes light (that is, its legal life) had been computed by Mr. Jevons in 1868 at eighteen years, and that of the half-sovereign at ten years. Mr. John B. Martin, in a paper read before the Bankers' Institute in 1882, corroborated the data upon which Mr. Jevons had arrived at these figures. In 1888 an inquiry by the Assay Department of the Mint, which included in addition to the method employed by Mr. Jevons and Mr. Martin for estimating the proportions of light and full weight coins in 10,000,000, pieces, the passing of each individual coin through one of the automatic balances, pointed to the conclusion that the life of a sovereign was somewhat longer and that of the half-sovereign somewhat shorter than the term Mr. Jevons had adopted. In 1895 a further inquiry was carried out by the Mint, the result of which indicated an even longer life than that estimated in 1888. During the last five years eighteen thousand pieces out of £9,300,000 of light gold imported into the Mint for recoinage have been individually examined and the result of the inquiry corresponds very closely to the conclusions arrived at in 1895. In these calculations many factors are necessarily absent. But the data which are available, so far as any conclusion can be drawn from them, indicate that the legal life of a sovereign may now be placed at not less than twenty-six years.

HOW THE JAPANESE EMIGRATE

IN an article in *Le Mercure*, some interesting statistics are given with regard to the Japanese. It was only in 1866 that the Emperor repealed the law forbidding Japanese subjects to leave their own country and take up their residence abroad. Nineteen years later 11,580 inhabitants of the archipelago had taken advantage of this permission. In 1900 there were about 124,000 Japanese living abroad.

In a pamphlet by M. Clavery, we are told that 90,000 of these Japanese emigrants were to be found, in 1900, either in the United States of America or in American colonies, and that in Hawaii 69 per cent. of the men employed on the sugar plantations were Japanese.

After America, Korea was the place preferred by these emigrants, as in 1900 there were between fifteen and sixteen thousand Japanese there, attracted, no doubt, by the construction of the Fusañ-Seoul railroad. England and the British colonies come third in rank as regards the preference given to them by Japanese emigrants. In 1900 we had 8215 Nippons among us, over three thousand of whom received passports for Canada. Of late years there has been so large an invasion by these emigrants there, that the Ottawa Government applied to the Emperor of Japan for an edict forbidding his subjects to settle in the Dominion. The statistics of 1900 showed that there were then about 800 Japanese in Australia, 700 in Peru, 1000 in the Dutch colonies, 200 in French India, about a hundred in Siam and about 2000 in Asiatic Russia. In France and Germany the number of Japanese residents varies between two and three hundred, most of whom are students.

In Belgium there were only twenty-one Japanese in 1900. In Russia there were fifteen, in Italy thirteen and in Holland six.

The result of this emigration to other countries has been the complete transformation of Japan itself, within the short period of from thirty to forty years.

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AN EXPLANATION AND SOME LETTERS

THE word Pianola is writ large in the history of music during the past few years. Every day since the time when this instrument was first made known to the public it has been creating new friends for itself, until now it is almost generally accepted that to realise and complete the piano's usefulness it is necessary to possess a Pianola also. Musicians, among whom one would naturally expect to find its most severe and exacting critics, have accepted it as an important addition to the pianoforte art, and the most famous pianists and composers, men whose names are known to all, have acclaimed the Pianola, in so many words, "an artistic and valuable aid to pianoforte playing."

The highest development of the Pianola idea is found in our latest production, the Metrostyle Pianola. Towards the successful evolution of this new instrument has been secured the co-operation of Paderewski, Moszkowski, Strauss, Grieg, Bauer, Hofmann, Chaminade, and other equally famous musicians. Its attainment is something unique in music. It enables any one to play according to the ideas and style of the above-named authorities. The tempo at which Paderewski plays, the dynamic effects he employs, his individual ideas of interpretation, the subtle changes and nuances that characterise the playing of this great master, have been recorded by him on Pianola music rolls. His whole conception of pianoforte playing, the result of all the knowledge and experience that such a virtuoso possesses, has been transferred by him to paper for the benefit of Metrostyle Pianola owners. This merely by way of instance; what Paderewski has done so have Chaminade and Bauer and others.

As with many great inventions, this creation of a new factor in music results from very simple means. In playing with the aid of the Pianola, the expression is controlled through what are termed expression levers. To one of these, the tempo lever (so named because its main function is to regulate the time at which a composition is played), is affixed a pen. When a composition is played with the Metrostyle Pianola this pen traces a line on the unwinding music roll, which line forms a faithful index to all the tempo and dynamic effects that have been employed in the rendition. All music rolls marked in this way are kept by us in order that facsimile reproductions may be made, which give to the world lasting records of great performances. But a greater and more interesting feature of the Metrostyle Pianola lies in the fact that, by following the printed line with the Metrostyle pointer, the artiste's playing is reproduced over again. For the first time, therefore, in the history of piano-playing, it is possible to fashion one's playing on the actual and authorised interpretations of the virtuosi of to-day. Recitals with the performances of Bauer, Hofmann, Chaminade, &c., as items on the programme, may be held in one's own home.

Apart from the interest and entertainment afforded by the Metrostyle Pianola, its value as a musical educator is a point of the utmost importance. It is as if one had the great

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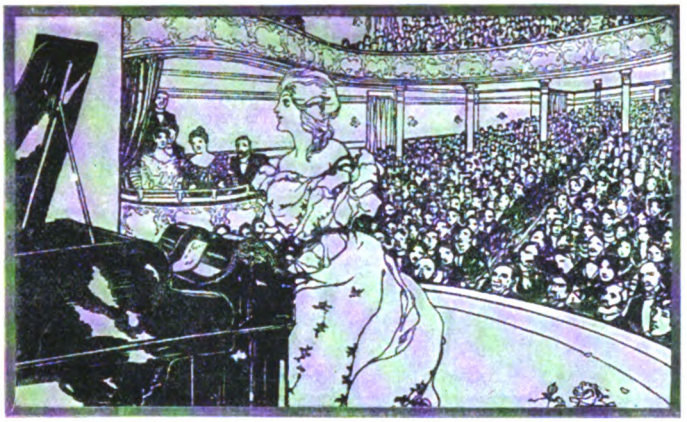

exponents of the pianoforte as tutors, for their ideas of interpretation are made common to all. In conclusion, to possess a Metrostyle Pianola is to have at one's command the key to practically all that there is of music, and to be able at any time to render the classics of pianoforte literature in a way that only the virtuoso can equal; lighter music too—marches, waltzes, comic operas, song and instrumental accompaniments, all are available. In short, money spent in the purchase of a Metrostyle Pianola brings a return in pleasure-giving occupation and entertainment sufficient to make it an investment of the soundest and most satisfactory nature.

It is a matter of importance to any one who is interested in music to know what the authorities of the musical world have to say about this new idea in pianoforte playing. Accordingly we print a few of the letters received recently. It will be seen that not only do they accept the piano-player idea as a sound one, but give as their unhesitating opinion that the Pianola is the best of all such devices, and that no piano-player is complete without the Metrostyle:

"I gladly acknowledge to you my great admiration for your Metrostyle Pianola. That through it the interpretation of an artist is reproduced as though he himself sat at the instrument would appear to me to be really incredible had I not heard it myself. The thought seems even yet like a fairy tale.

"DR. RICHARD STRAUSS."

"I consider your Pianola with the Metrostyle an invention of the greatest importance to musical art. My first impression upon hearing an instrument of this kind was that it would be harmful and misleading; but the Metrostyle Pianola has completely changed my opinion, for not only does it play the notes correctly, but with the Metrostyle, interpretation is given which is equal to that of an artist. Your success is assured.

"JOSEPH JOACHIM."

"I have heard the Metrostyle Pianola, and consider it most admirable and interesting. Before hearing the Metrostyle I had thought that all such instruments were only machines, but it is indeed surprising what can be done with the Metrostyle in reproducing musical works in the way of giving the intention of the composer. It is excellent.

"EDVARD GRIEG."

"The Metrostyle Pianola which I have just heard has filled me with admiration and wonder. Although I had heard instruments that play the piano before, I had no idea that it was possible to play with the taste and expression of an artist; and the Metrostyle, it seems to me, is almost as valuable as the instrument itself. Your success with the Metrostyle Pianola should be very great.

"E. HUMPERDINCK."

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"The Metrostyle Pianola marks an epoch in the history of music. In effect it not only permits every one, musician or not, to play the most difficult and intricate composition; but, what is more marvellous, it reproduces the personal interpretations of the most celebrated pianists.

"This instrument stands in a class by itself, and possesses in the highest degree the musical and artistic qualities which, until the present, were found only in the virtuoso.

"As an accompanist it astonishes one not only by the delicacy of the effects produced but also by the manner in which it responds to the will and individuality of the player.

"MATHILDE MARCHESI."

"I have often been asked to express my opinion of the various piano-playing devices, but have refrained hitherto because, apart from their achievements in technique, I did not consider them to possess any real artistic value.

"When I heard the Pianola, however, I was immediately convinced that it was an instrument which, in addition to its mechanical perfection, would give great scope to one's musical temperament, and permit one to play with expression and perfect artistic taste.

"A minute examination of the qualities of this marvellous instrument has convinced me that the Pianola is unique of its kind, and deserves the high place which has been assigned to it by the most eminent composers and pianists of the day.

"C. CHAMINADE."

"In the presence of the undersigned and a great number of teachers and scholars of the Royal Academy, Mr. Muetter yesterday conducted in one of the large rooms of the Institution, a demonstration of the Metrostyle Pianola. Among the works given, two compositions, namely, the variations of Pachulski and the variations of Rosenthal, both compositions for the virtuoso of the most extreme difficulty and brilliant effects, were produced. It is astonishing how much freedom of movement can be shown both as regards dynamic and rhythmic effects by a skilful handling. So far as the limits allow, *if indeed any exist*, the abilities of this device as compared with the living personal rendition of an artist have reached the highest result obtainable.

"JOSEPH JOACHIM.
"ERNEST RUDORFF,"

Professor and President of the Department for Piano and Organ in the Royal Academy for Music in Berlin.

[This letter is of special significance. It records the impression created by a Pianola demonstration given at the Konigliche Akademische Hochschner für Musik in Berlin, perhaps the most famous musical conservatoire in the world.]

"When I first heard the Pianola it was difficult to believe that it was not an artist performing, for the difference between its playing and that of other self-playing devices is so great as to be startling.

"I sincerely congratulate you, and hope every one interested in good music will hear the Pianola.

"HANS RICHTER."

"After hearing the Metrostyle Pianola, I gladly acknowledge that this instrument in its artistic perfection has completely surprised me. If one closes one's eyes, one receives the impression of hearing the expressive playing of a virtuoso. With correct handling, a most effectual and correct rendering is possible. It

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has given me the greatest pleasure to become acquainted with your invention.

"FELIX WEINGARTNER."

"Apart from its unique achievement in allowing one to play pieces at the tempo of the composer, or whoever has marked the music rolls, the point about the Metrostyle Pianola that struck me most was the fact that the intervention of the Pianola between the performer and the piano did not impair the control over the actual sound production. In truth, it rather simplified the matter, since, difficulties of technique being eliminated, the tendency was to devote one's attention solely to the emotional side.

"A. C. MACKENZIE."

"I heard your Pianola to-day for the first time, and I am intensely interested and astonished at its marvellous performances. It is musical and artistic, and when used in connection with the Metrostyle, simply stands alone, and cannot be classed with any other instrument played by auto means.

"Wishing you well-merited success,

"HENRY J. WOOD."

Any one desiring further particulars of the Metrostyle Pianola is requested to fill up the form at the end of this advertisement, and send same to us by post.

To the . . .

ORCHESTRELLE COMPANY,
Aeolian Hall,

135-6-7 NEW BOND STREET, LONDON, W.

Please send me further particulars of the Metrostyle Pianola.

Name.....

Address.....

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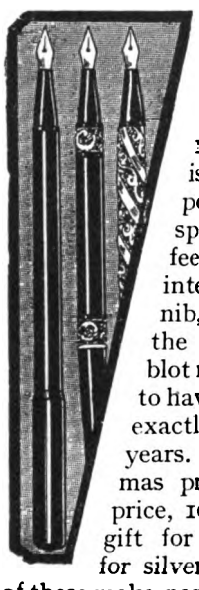
WHAT TO GIVE FOR CHRISTMAS PRESENTS

SOME SEASONABLE SUGGESTIONS

Waterman's Ideal Fountain Pen

AMONG the universally acceptable articles, that will gladden the heart of either man or woman, WATERMAN'S IDEAL FOUNTAIN PEN deserves a word of special commendation. Nearly every one writes in these days even in the literary sense, but everybody without exception, writes in the ordinary meaning of the word. One of the universal needs, therefore, is an efficient pen, and a Christmas present of a WATERMAN'S IDEAL FOUNTAIN PEN exactly answers that description. The makers of this famous pen claim for it that it is the best in the field, and that claim is supported by the testimony of a host of eminent users of it. For instance, Mr. St Hilaire Belloc, whose clever books are just now attracting so much attention, writing in the *Outlook* of November 5, says, "The pen is of pure gold, a pen that runs straight away like a willing horse, or a jolly little ship; indeed it is a pen so excellent that it reminds me of my subject"; and after this involuntary tribute the genial writer goes back to the main point of his essay. WATERMAN'S IDEAL FOUNTAIN PEN is the freest, cleanest writer it is possible to imagine. One of its special features is its spoon-feed, which ensures an even, uninterrupted supply of ink to the nib, and automatically regulates the flow so that it can neither blot nor spurt. It is, indeed, a boon to have a pen that will "fit your fist" exactly, and not need changing for years. Such an article forms a Christmas present of real value, while its price, 10*s.* 6*d.*, makes it a reasonable gift for all. There are other prices for silver and gold mounts, and some of these make particularly dainty gifts for ladies. But whatever the price, every shilling spent over 10*s.* 6*d.* is for the mounting. The pen, in every instance, is precisely the same in construction, the 10*s.* 6*d.* pen being as effective for writing purposes as the most expensive. All stationers and jewellers show WATERMAN'S IDEAL FOUNTAIN PEN, and the proprietors, L. and C. Hardtmuth, 12 Golden Lane, London, E.C., are always prepared to send their dainty illustrated booklet on pens anywhere post free.



GOOD cheer being especially seasonable at Christmas time many givers of presents like to forward a reminder of good-will in the shape of a case of spirits. For this purpose nothing can well serve better than a case of OLD BUSHMILLS' THREE STAR WHISKY, because nothing can be purer or finer in its line than the whisky of this celebrated brand. In these days, when so many raw, poor quality whiskies are on the market, it is well to be able to turn to a refined high-quality, well-matured article like the OLD BUSHMILLS', which is distilled from home-grown barley, and is sent out in a condition of guaranteed age and fineness. A 45*s.* cheque will ensure the immediate forwarding to any address of a case of twelve bottles of this superb spirit, which will at once gratify the recipient and do honour to the good taste of the giver. OLD BUSHMILLS' THREE STAR WHISKY sets a standard that is rarely reached, and cannot be improved upon. The highest resources of the distiller's art is brought to bear upon its production, and the result is a combination of qualities that afford the consumer a degree of enjoyment that would be impossible with an inferior whisky. Such a whisky as OLD BUSHMILLS' is a safe whisky. It is as palatable as it is good, and imparts a genial warmth to the system that is especially appreciated at the colder period of the year. It is essentially a whisky to do credit to the festive board, and, considering its indisputably fine quality, its price is exceedingly reasonable. While adding to the joys of the Christmas season, it will also afford a guarantee of rational pleasure without detracting effects of any kind. A good honest whisky like this forms an ideal Christmas beverage. The fact that Old Bushmills' has been awarded the highest attainable honour, the Grand Prix at the St. Louis Exposition, adds further testimony, if testimony were needed, to the high quality of this renowned whisky. The distillery offices are at Hill Street, Belfast; and the London cellars, 20 Mark Lane, E.C.

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AMONG the numerous presents gentlemen receive from their lady friends at Christmas time it is safe to say none are more appreciated than those which minister to their favourite relaxation, but the average lady knowing little or nothing about the mysteries of pipes and cigars, usually falls into the error of buying some showy article which any man of taste or refinement would probably despise, but, of course, he is too considerate of the giver's feelings to say so. A far safer plan is to get a first-class catalogue such as that issued by Allen and Wright of Piccadilly Circus—this is sent post free, and illustrates almost every conceivable variety of such goods as smokers delight in, and everything of the best.

THE "MOTORIST'S" PIPE
Two sizes 12s. 6d. and 14s. 6d. straight or curved stem

We have selected for illustration one of this well-known firm's specialities which seems to us an ideal pipe for motorists. It is extremely light and has a solid silver cover which can be entirely removed, and is altogether an elegant, and, above all, useful present which ought to please the most fastidious smoker.

So many of the readers of THE WORLD'S WORK AND PLAY are motorists that it gives us specific pleasure to commend such an article as this to their notice.

♣

WHEN a business man desires to make a present to a business friend he is frequently at a loss what to give. There are so many fancy articles which, often as not, are of no earthly use to the man of affairs, that the most sensible course is to make a choice from the goods which are of approved reputation and sure to be of service. What better in such a case than a Typewriter? It is always useful, and a standard machine lasts practically a lifetime, so that the donor is sure of appreciation and continued remembrance. Some guidance is necessary, however, in the choice of a Writing Machine. Personally the writer has a penchant for the Yōst. It is the most handsome Typewriter on the market, and, moreover, it is the most convenient. The absence of all the worrying little bits of mechanism which usually accompany typewriters, makes the Yōst unique. There need be no trouble in learning to operate this machine. All that is necessary is to insert the paper and strike the keys. Each key operates one letter. The drawback with most typewriters is that they are generally provided with a shift key, as it is called. When a capital letter is required, it is necessary to depress two keys to obtain it. Not so with the Yōst; which is so simple that business men and private individuals find it a pleasure to operate it. It has no troublesome ink ribbon to wind and unwind; its inking device is a Pad, which, once inserted, needs no attention until it requires renewing. The absence of ink ribbon allows the type to come into direct contact with the paper, and give a sharp, clear imprint. Hence the Yōst is known as "The Typewriter of Beautiful Work." Truly it makes an ideal Christmas present for lady or gentleman.

♣

AT Christmas time "sweets to the sweet" are peculiarly appropriate. Whatever other presents we may be making, it is essential that they should be supplemented by a box of sweets. But in this case, more almost than in any other, it is necessary that the choice should be a good one. None but the highest-class confections should be permitted to be sent as a Christmas gift; and to make assurance doubly sure, the best way is to go to one of the best establishments, such as that of Messrs. Clarke, Nickolls, and Coombs, Ltd., at 97A Regent Street, W., whose reputation as purveyors of refined, first-quality confections extends far and wide, or send for their charming booklet, which will be forwarded post free. Nothing could be daintier in appearance, or more delicious in their contents, than the rich variety of boxes of sweetmeats which are so temptingly set forth at this elegant "Clarnico" house. Chocolates, creams, wafers, caramels, candies, toffees, and bonbons, and an endless string of other sweet things, are there for the choosing.

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"CLARNICO" SWEETMEATS FOR CHRISTMAS

Especially suitable for Christmas gifts are the Bonbonnières of chaste and exquisite design in glass, metals, satins, woods, &c., filled with the choicest confections, and ranging in price from a few shillings to several pounds each. These are specially packed, the top layer being embellished in correct tints with flower emblems, together with initials or Christian name of the person for whom the gift is intended, these designs being delicately inlaid with Dragées Argentées. A "Clarnico" Bonbonnière is decidedly a Christmas present not to be overlooked.

♣

THE SWAN FOUNTAIN PEN of Messrs. Mabie, Todd and Bard, is another example of a perfect Christmas present, inasmuch as it can be given to either a lady or a gentleman with the absolute certainty of being highly valued. There are so many Fountain Pens of inferior make on the market that in making choice of one it is important to buy only the best. The SWAN FOUNTAIN PEN is, as its makers aver, "in every respect as nearly perfect a fountain pen as it is possible to produce," and every pen is unreservedly guaranteed. From literary men, business men, and writers of every kind, the most flattering testimonials have been received, bearing witness to the high merit of the "Swan." Mr. Hall Caine wrote the whole of his novel *The Manxman* with a "Swan." "It has become quite indispensable to me," he writes. "I can use it with ease and certainty, anywhere and at any time, even in the dark, in bed and on horseback!" The price of the ordinary SWAN FOUNTAIN PEN is 10*s.* 6*d.*; but it can be had in elegant and handsome gold and silver chased mountings at prices ranging from 25*s.* to £8 10*s.*, with names or initials engraved upon them in any style. As a gift of remembrance a "Swan" Fountain Pen is entitled to be very highly regarded, there being instances of a "Swan" remaining an efficient writing instrument for as long a period as twenty years. All stationers sell them, or they can be had direct from the makers, Mabie, Todd and Bard, 93 Cheapside, London, E.C., who will send descriptive illustrated catalogue post free to any address.

♣

MESSRS. GILL AND REIGATE, at their extensive and beautifully arranged series of show-rooms, 73, 75, 77, 79, 81, 83, and 85 Oxford Street, have an unequalled display of articles of antique and modern furniture and decorative objects eminently suitable for Christmas and New Year presentations. The establishment contains many sections, but only two main divisions—the antique and the modern. For the antique portion the good old title of The Old Curiosity Shop has been very appropriately adopted. It is an Old Curiosity Shop more wonderful than Dickens ever dreamed of, and forms an exhibition of great variety and surpassing interest, and is one of the places to be visited. Such a collection of genuine antiques has rarely been got together, and among them will be found, at very moderate prices, numerous of those smaller articles which curio lovers set so much store upon. Nothing could be better adapted for presentations. There are fine specimens of Old China, rich in design and colour; an unique assortment of Old Silver and Sheffield Plate in a capital state of preservation; Old Pewter of rare quaintness; Old Prints by the most eminent eighteenth-century masters; samples of old Brass

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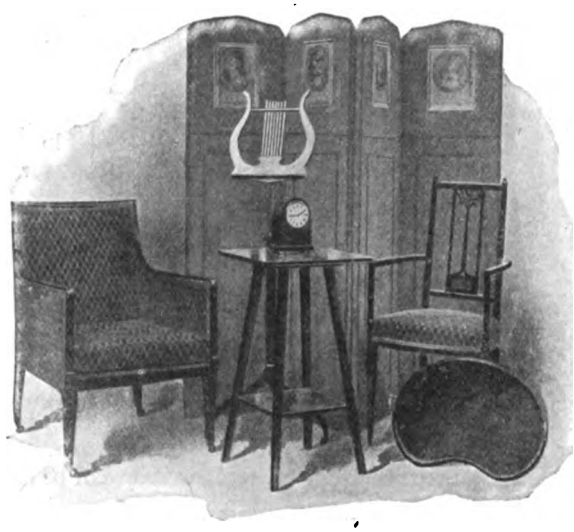
Work in massive form and design; cabinets, tables, chairs, trays, writing-desks, stands, mirrors, footstools, bureaux, chests of drawers, warming-pans, clocks, screens, ornaments, and thousands of miscellaneous articles of *bijouterie* and *vertu*, any one of which would gladden the heart of a recipient at Christmas time. This Old Curiosity Shop is remarkable for the fact that most of the articles included in it are useful as well as decorative, whereas in many stores of antiques the useless predominates. To go through these far-reaching rooms of ancient things is like being taken back into the sixteenth century. There is an astonishing wealth of old oak. Wondrous oaken carvings, great oaken beds of state, dark oaken wainscots, and fantastically shaped oaken bookcases form the background of the picture; but smaller objects are scattered around in all directions, and from these may be picked up Christmas presents suitable for almost any requirement, great or small, at prices that will not be any particular strain upon the purse. Passing across to the modern side of Messrs. Gill and Reigate's show-rooms one is struck by the many examples one sees of the successful adaptation of the older Chippendale, Sheraton, and other now classic models—that they are new is evident; that they are beautiful is also evident; and for those who are not wedded to the sentiment of actual age, these modernised examples will probably be more attractive than the genuine antiques. It is all a matter of taste. Those who wish for a suitable Christmas or New Year's gift amongst this rich array of new articles will not have far to seek. Something attractive offers at every turn. Chairs in taffeta or art linen, inlaid Sheraton bookcases and cabinets, photo screens in Jaspé tapestry, card and occasional tables in satin wood or inlaid mahogany, down cushions in brocade, silk, and tapestry, mirrors of dainty design, hand-made Persian rugs, clocks in amazing variety, and oval trays of inlaid, are among the articles that are spread in tempting array before the visitor. Such things are *par excellence* the right Christmas presents for the home. A dainty little illustrated booklet has just been published by Messrs. Gill and Reigate, and we recommend our readers to send for it.



A FEW INEXPENSIVE PIECES OF ARTISTIC FURNITURE AT MESSRS. GILL AND REIGATE'S SHOW-ROOMS, 73–85 OXFORD STREET, W.

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MARQUIS OYAMA AND HIS WIFE

MARQUIS OYAMA IS THE COMMANDER-IN-CHIEF OF ALL THE JAPANESE ARMIES IN THE FIELD. HIS WIFE IS A GRADUATE OF AN AMERICAN COLLEGE

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The World's Work
And Play

EDITED BY HENRY NORMAN, M.P.

VOL. V LONDON, JANUARY 1905 No. 26

LONDON'S NEW ELECTRIC RAILWAYS

SIXTY MILES OF TUBE AND TUNNEL—THE LARGEST POWER STATION IN THE WORLD—A GREAT REVOLUTION IN UNDERGROUND TRAVELLING

BY

EDWIN SHARPE GREW, M.A.

Illustrated from photographs specially taken for THE WORLD'S WORK

THE truly comprehensive view of the system of electric railways which are to underlie London will best be taken by the Londoner who, in the course of the next twelve or eighteen months, will be able to travel through sixty miles of tube and tunnel without passing twice over the same stretch of line. If, in the course of this journey he should reflect that the power which drives his train—and every other train on the crowded mileage of the electric track—is derived from one great source of energy in a building at Chelsea, he will begin to gain some idea of the might, majesty, dominion, and power of electrical engineering. It is possible that he will not concern himself very greatly about the effort, the strain, the exercise of brain by which the achieved results have been made possible. If it is the triumph of art to conceal art, it is no less the engineer's aim so to perfect his task that no irregularity in its response to subsequent testing shall ever reveal the difficulties of its construction. The best engineering is that which produces something that always goes smoothly. It is only when the thing is being made that its difficulties can be revealed; and even these the engineer and the contractor are very chary of revealing to any one but each other. To those who have the intelligent curiosity to inquire how the world's work is done, the present stage of the operations for converting one railway to electric traction, of constructing other railways without an hour's interference with the business of the counties they are intended to serve, and of supplying all these avenues of traffic with electric power, is of absorbing interest. Nothing is complete; but in each section of the whole the back of the job is broken.

We may first take a glance at the lines themselves that are being electrified, or constructed as a preliminary step to electrification. The inner circle, which is not a circle but is shaped something like a gouty Wellington boot, is laced and crossed by four lines which are to communicate with it. There is the Baker Street and Waterloo Railway, which was begun six years ago, and would have been completed now had not its difficulties been added to by a period of financial strain. That railway after a curve under Regent's Park cuts across the circle by way of Piccadilly Circus, Oxford Circus, and Trafalgar Square. It passes beneath the Thames and is running on to the Elephant

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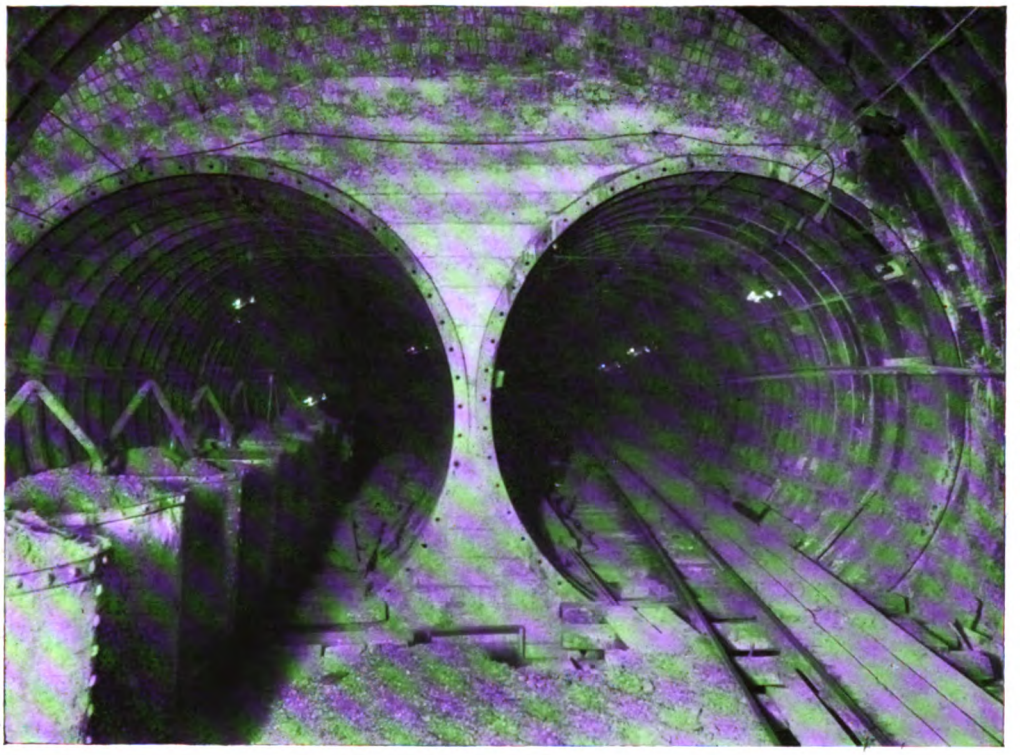
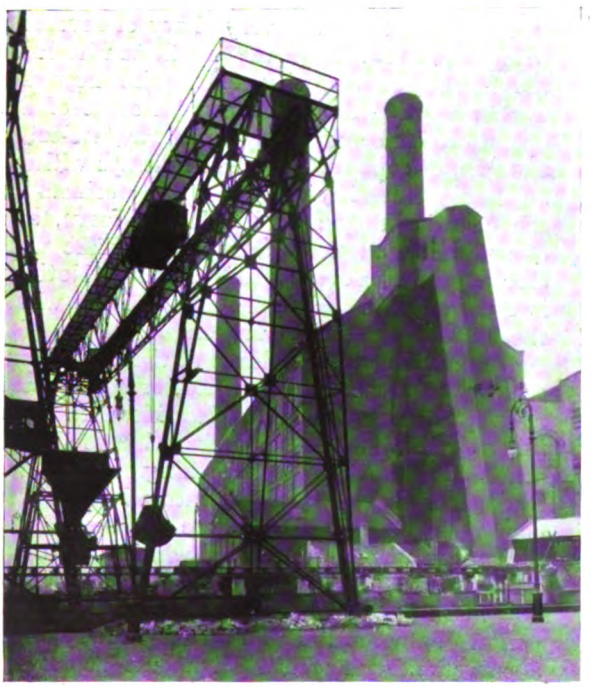


THE TUBES UNDER PICCADILLY CIRCUS



THE GREATEST ELECTRIC POWER STATION IN THE WORLD
At Lots Road, Chelsea

and Castle. Next in order is the Piccadilly and Brompton Tube, which starts near Hammersmith and runs nearly parallel to the River, underneath the District Railway at West Kensington, past Earl's Court and South Kensington, beneath the Brompton Road, through Knightsbridge to the Circus Junction. Here it comes into sub-communication with the Waterloo and Baker Street. Like that railway it is to be extended beyond its original terminus. It will go on to Holborn, passing the Charing Cross, Euston, and Hampstead tube (the third of our projected railways) and joining the fourth of them, the Great Northern and Strand, at the Holborn Junction. The Great Northern and Strand runs from Finsbury Park to King's Cross. Like all the other tubes, and like the parent ring which couples up them all, it is capable of extension.

As at present proposed, the first railway to be worked electrically will be the Metropolitan District itself; the next will be the Baker Street and Waterloo; and the Great Northern plus the Piccadilly and Brompton will take precedence of the Charing Cross, Euston, and Hampstead. These tubes are

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in stages of completeness approximating roughly to the order in which they are to be opened and fed. Of the Baker Street and Waterloo line, to which we shall have further occasion to refer, all the tunnels are driven between Lisson Grove and Waterloo; the shafts are all sunk; the permanent way is now being laid. On the Great Northern, Piccadilly, and Brompton line, the tunnels between Earl's Court and Down Street in Piccadilly are driven; and at the Great Northern section at right angles to this the tubes have been taken from Finsbury Circus to Holborn. The tube tunnels of the Charing Cross, Euston, and Hampstead line are being driven at several points between the terminal stations and are rapidly nearing final through connection.

Perhaps to an engineer alone does this curt summary convey any intelligent idea of the amount of work done, of the cost in brains as well as in material, of the multitudinous sources which have been drawn on for machinery, for equipment, and for power. The other morning a four-ton reel of cable crashed through a platform at Charing Cross, and delaying thousands of people on their way Citywards, threw the whole system of the Underground out of gear until late afternoon. Yet how insignificant a factor in the whole scheme was this length of cable! It points a comparison none the less. If the removal of this incidental reel occupies a breakdown gang for some hours, what amount of labour and forethought is required for boring out fifty miles of underground tunnels through the London clay, tunnels that have to be driven as a scoop is driven into a cheese, and every pound of earth picked out from the scoop and brought to the surface fifty, sixty, eighty feet overhead. What additional labour is wanted for the cutting out of the stations and subways underground, for the carrying of one tunnel, or one railway, under another; what precautions when thrusting the scoops beneath the bed of the Thames; what difficulties have to be met when lifting or transferring the tangled mesh of cables, pneumatic and hydraulic tubes, wires and sewers, when the tunnels approach the surface? What, too, is to be said of the construction of the great

THE FURNACE CORRIDOR AT THE GREAT POWER STATION

Showing the automatic stokers

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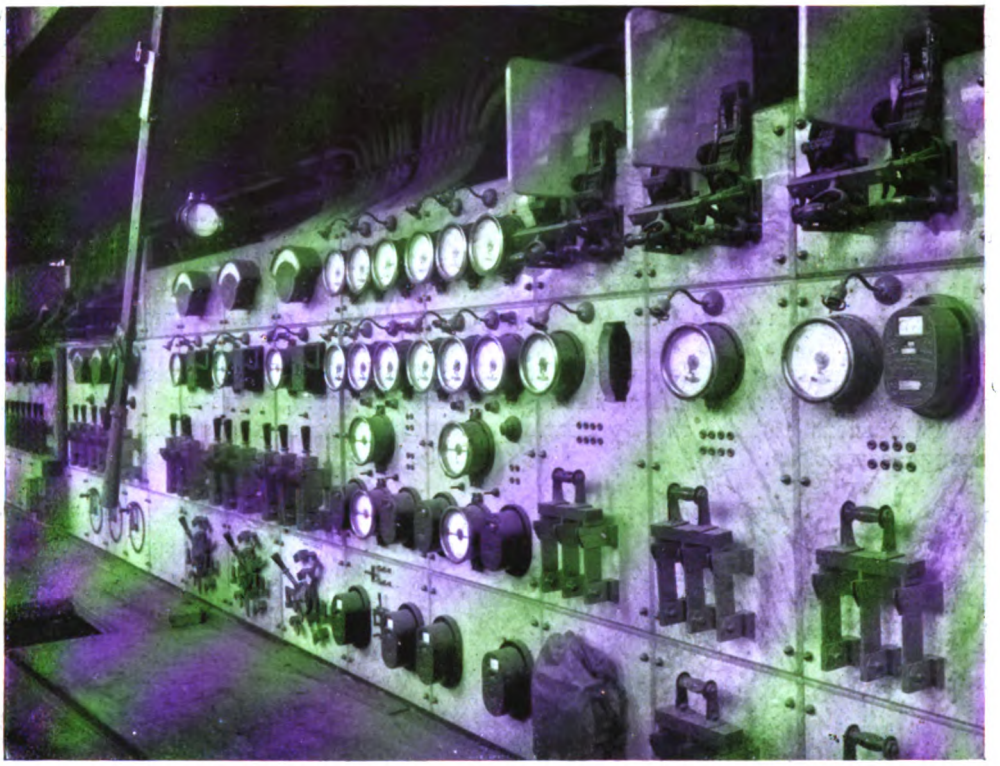

SWITCHBOARD OF THE SUB-STATION AT WEST KENSINGTON

power house, with its hundreds of leagues of cable connections, its thousands of feet of boiler surface, its tens of thousands of developed horse-power? It is not the building and equipment of this great station that is the most wonderful thing about it, but the planning of it. From this station stretch the ducts, sixty-four pipes embedded in concrete, which, radiating from Earl's Court, carry the power to the twenty-three transforming stations. Every cable, every transformer station, every engine and dynamo, every subsidiary wire and bond, must be devised and planned in "*interdependence absolute, foreseen, ordained, decreed . . .*"

The work of converting the existing Underground Railway to the running of electric trains has sometimes been spoken of as the lightest part of the task. The permanent way, the tunnels, the stations were already in existence and at work. What was there to be done beyond the laying of conductor rails and feeder cables, the bending of the track rails for the electric-signalling system, the provision and equipment of the sub-stations? If any one had accompanied the representatives of THE WORLD'S WORK over the Underground to survey these operations, carried on by night as well as by day, he would soon have been rid of any mistaken notion as to the unimportance of the work. Even if by touch of some magician's wand the whole thing could be completed, from power station to the last item of rolling-stock, it would still be impossible to run electric trains without experiment. Perhaps when all is said and done, the most significant token of the importance of these laboured works, these vast designs, is the existence of the branch line on the District Extension near Mill Hill Park, where, on six miles of double track, experimental electrical trains have been running for six months past, with electricity taken from a temporary power station at Alperton.

We have dwelt at some length on the general aspects of the scheme. Of its component parts the great Power Station in Lots Road is the most dominant, and the most imposing alike to the eye and to the imagination. The most unscientific person is vaguely aware that heat and work are interchangeable—so many units of heat put in, so many units of work taken out. When the electric Underground is running, he will be able to see for himself this transformation in process. The coal comes up the River

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THE GRADIENT BETWEEN THE TUBE SYSTEM AND THE DISTRICT RAILWAY

Near Hammersmith. The Great Wheel at Earl's Court will be seen in the background

WORKING UPON THE LARGE SHIELD AT CROSSOVER TUNNEL, 23 FT. DIAMETER

Kennington Road Station

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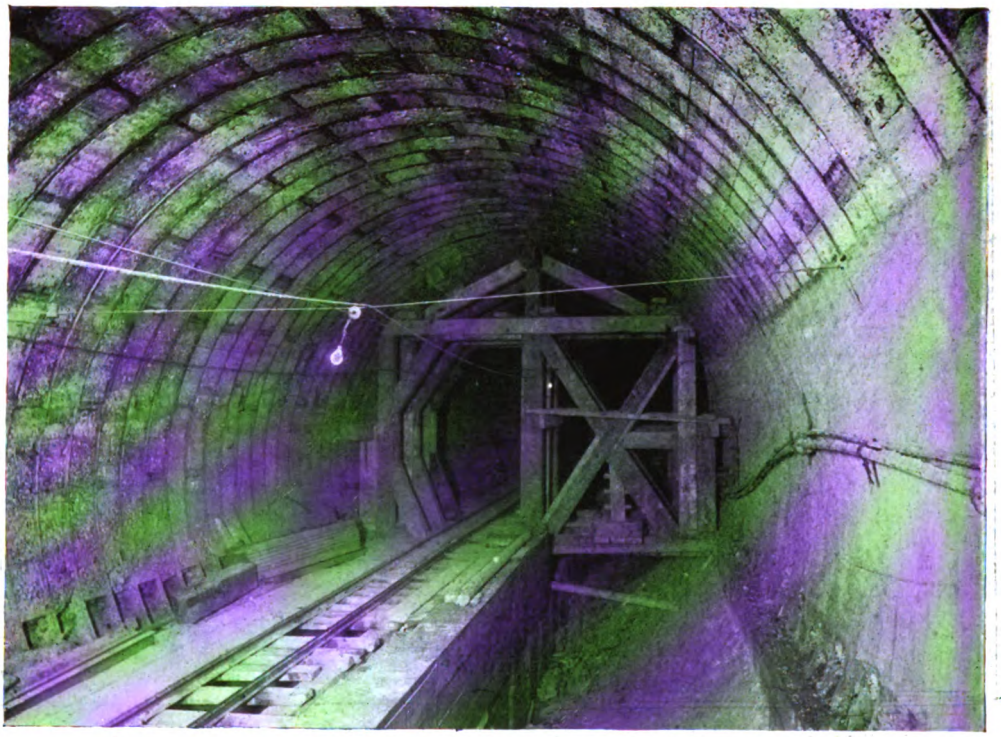

WHERE ONE TUBE PASSES OVER ANOTHER

Showing the temporary internal bracing

Thames in barges; and the barges pass through the lock into a siding of Chelsea Creek. Two overhead electric cranes span the siding, and each reaches down a grab to the coal. The grab lifts out the coal, a ton at a time, whisks it into a conveyor by the side of the wharf. The conveyor travels endlessly along, tipping the coal into the receiver of a huge coal lift, which, following the American fashion, we call an elevator. The elevator carries it along an incline which is nearly perpendicular to the top of the power house, and here casts it into bunkers that hold 15,000 tons apiece. From the bunkers the coal slips down pipes, to the furnaces at the foot of the building, 140 ft. below. It is fed to the furnaces which will eat it up to the tune of 800 tons a day, by eighty steam stokers—it is as free from the touch of the hand of man as the dough in an automatic bakery—and the furnaces ply eighty water-tube boilers, whose heating surface, when every boiler is working, will amount to nearly half a million square feet.* The boilers are arranged in batteries, eight boilers to a battery; and each battery will drive a steam turbine.

* Each boiler has 5212 sq. ft. of heating surface, and 672 ft. of superheating surface.

When the scheme is complete, there will be ten batteries and ten steam turbines. Each turbine will develop 8000 h.p.; power enough, taking them altogether, to drive the battleships of the Baltic Fleet. The turbines will be diverted to the pacific purpose of driving the great electric generators, each wound for an electric pressure of 11,000 volts. In a few months the Chelsea Station will be vibrating with a power which, stated in electrical terms, will amount to a capacity of 57,000 kilowatts generated at a voltage of 11,000.

That statement as it stands is coldly impressive; and it gains only a little more from the corollary that the station is the largest in the world; that the steel framework weighs 600 tons; that its four chimney stacks are each 275 ft. high. The chimneys are, by the way, easily conspicuous on a clear day from the furthest point which the District Extension reaches, and they have added the finishing touch to the disfigurement of the Chelsea Reach, which artists have striven for so long to preserve. But for a right appreciation of the Electric Generating Station one must enter it. It is not for nothing that it is called the power house. Power permeates it, from

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the sunken basement where the monstrous boilers throb and spurt, to the galleries where, speckless and twinkling, the panels of the switchboard stretch and the needles of the voltmeters and ammeters twitch responsively to the current. There is no great noise or disturbance in the building; it is quiet by the side of a torpedo-boat yard, for example; the sound is that of an even roar. But the sound is a thousand times more impressive than clangour; and there is an oppressive sense of hidden force and peril. When a test is running, as was the case when our photographs were taken, danger boards are placed in all the galleries, and workmen are stationed at every avenue which leads to live cables, so that no uninstructed person shall pass—or touch. To one spectator at least the occasion brought a memory of the lines which some electrician versifier once dedicated to the goddess Electricity:

> "Thine ears all distance overcome,
> Thine eyes the dark make clear,
> Thy feet are Speed, thine arms are Power,
> Thy clutch is Death-in-Fear."

Such fancies are, no doubt, very foreign to the matter-of-fact men of brains and skill who have supervised, and are supervising, the assemblage and installation of the means, the machinery, the devices, which will make the Lots Road Station not only the most powerful in the world, but the one in which economy of means is most perfectly wedded to effectiveness of result.* We have not space to describe, we have barely opportunity to mention, these means, the variety and application of which range from the railway track laid under the boilers to remove the ashes; from the supplementary engines which excite the magnets of the great generators, to the mile of switchboards in the three galleries; and to the oil switches and the potential transformers which make the handling of an 11,000-volt current possible.

From the power house one might turn for the elaboration of detail which a comprehensive survey of the scheme demands, to the work done in constructing one of the tubes which it will feed. The Waterloo to Baker Street tube is, from its varied difficulties and experience, both above ground and below, the most typical. No doubt everybody is familiar with the general principle of driving such tunnels. A pit is dug in the earth, iron caissons are sunk in a series of sections, like broad-banded hoops of iron pressed one on top of the other, till the caisson lines the pit. Then when the necessary depth is reached a tunnel is thrust out from the bottom of the pit. The tunnel is scooped out by the Greathead shield, which, in operation, has been sometimes compared to a cheese scoop, and sometimes to a champagne bottle thrust butt foremost through the earth. For the completion of the second simile we should have to imagine the rim of the bottle to be quite sharp, and to picture the workmen stationed in the hollow cone at the bottle's bottom, and removing the earth thence, as the rim is shoved forward from behind. With the help of this picture we can explain the working of the Greathead shield, which will be of eleven feet to twelve feet in diameter when it is boring out an ordinary length of tube, or eighteen to twenty-four feet when it is making the larger tunnel in which a station and its platforms are situated. The shield is surrounded by an open cylinder about six feet in length, which is exactly the same size as the tunnel to be bored, and on the hithermost side of the rim of this cylinder are fitted hydraulic jacks. First of all the workmen on the shield—the number of whom varies according to the size of the shield—pick out the middle of the clay face, generally by pick, though lately a rotary excavator has been used. When the middle part of the clay has been worked away the hydraulic jacks thrust the cylinder with its cutting edge three feet forward. Then behind it, while the workmen on the face of the shield clear out the clay, the other men in the gang build up curved lengths of girder iron into the three feet of space that has been cleared; thus a ring of iron, the first section of the coming tube of iron, is fixed and bolted in the underground earth. The hydraulic rams use this ring as a coign of purchase for pressing the cylinder further forward, and thus section by section the tunnel is driven. Between these iron walls and the clay outside, cement grout is pumped, filling up the small interstice left by the width of the steel cylinder, and making all secure. Generally a shield cuts and binds to the extent of forty-four rings of iron girder work a week, which is to say about seventy feet. But sometimes as many as eighty rings of one foot, eight inches in width have been bolted and fixed in the week by one shield gang. The shields are at work intermittently wherever a shaft is sunk; and when

* It should be mentioned, of course, that part of the Inner Circle will be worked from the Power Station at Neasden, which is under the control of the Metropolitan Railway.

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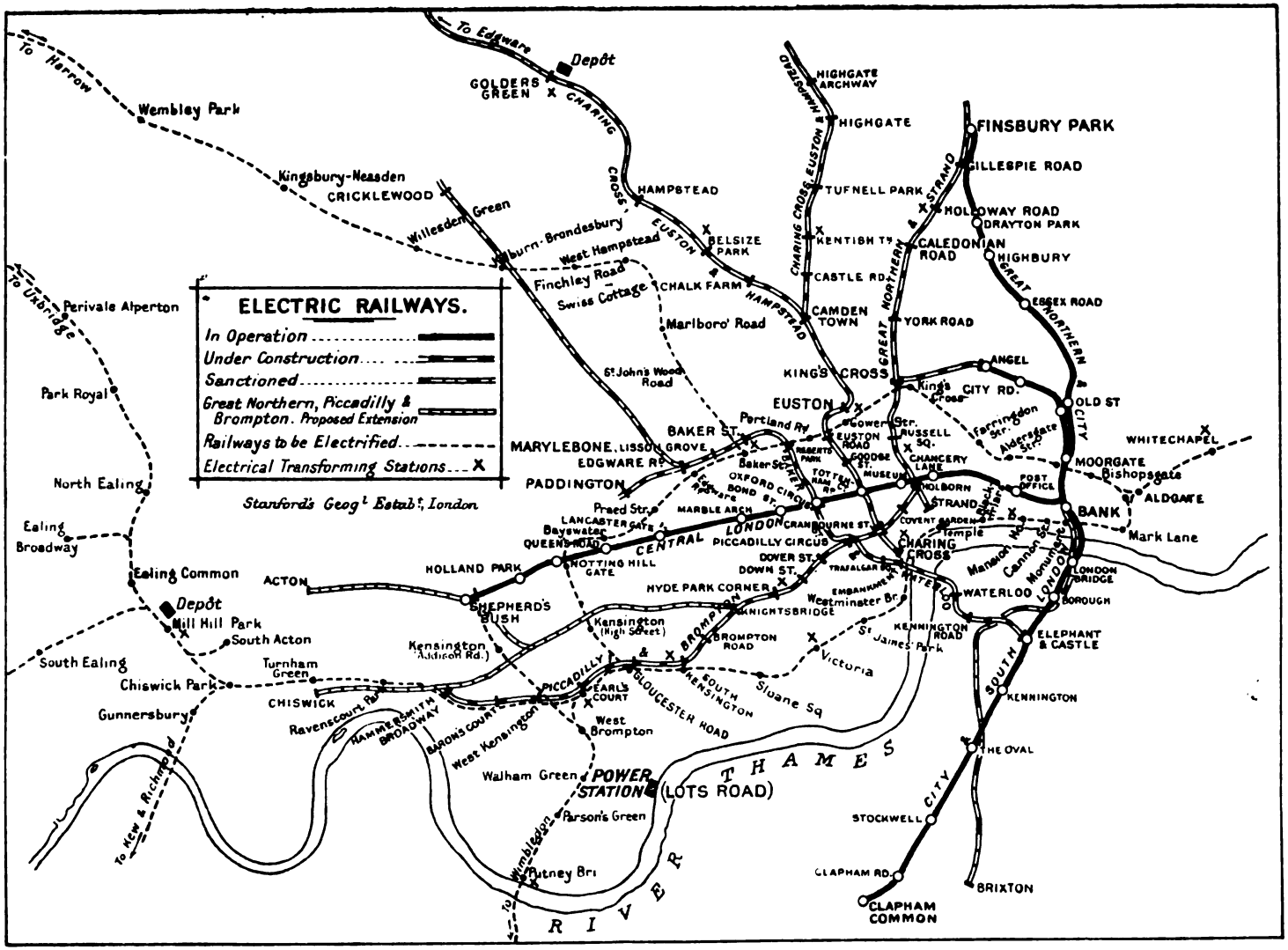

A MAP OF LONDON'S ELECTRIC TRACTION

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the Waterloo and Baker Street tunnel has been driven at its fastest there have been six shields at work.

This, however, is contractor's work. Its difficulties you will best appreciate if, permission granted, you make your way across the staging to the island platform at Hungerford Bridge, and are swung down the black caisson by a crane bucket to where, below the bed of the river, the trucks rumble past with loads of clay; or if again you visit the south side where the Greathead shield is thrusting its way through the last feet of London clay that bar the tunnel's way to the Elephant and Castle. What of the engineer's work and forethought? To the meanest comprehension it seems a splendid work to thrust the tunnel beneath the river's bed, meeting with considered plan and swift device the difficulties of watery gravel and of possible inrush of water. That was done by the use of air-locks and by using compressed air at such a pressure that so far from the Thames flooding the tunnel the river was made to bubble like a fountain by the pumped air forced upwards through its bed, and the tube was laid under the river without a single accident. What is to be said, too, of the harassing task of providing for the removal, transfer, and encasement of the network of tubes which the engineers encountered at surface stations, or when constructing the subways at Trafalgar Square? These things, so neat, so workmanlike, so simple when we look at the finished job, rounded off with its armour of encaustic tiles, have been as nightmares on the minds of those who have accomplished them and thought them out. But beyond all these doings, or so it seems to the writer, is the planning of it all. Will any one consider what he should do if he were sunk in a pit, on the site of where a Piccadilly public-house used to be, and were told that he was to construct a tunnel which was to meet one coming from another such pit sunk at Baker Street? That was the task set before the engineers of this railway. They had to design the line, yard by yard, that the two tunnels, which eventually met without the error of an inch and a half at Langham Place, had to take.

The setting out of the tunnel must be calculated with a nicety which is measured in thousandths of an inch, for a thousandth of an inch deflection at Baker Street would mean a serious error in a mile of working. No less nicety is required in the planning of the bends in the tunnel, which are approached by a series of transitional curves. But the shield works in a straight line and these lines, the chords of the curve arcs, must be ascertained trigonometrically by calculations which demand the use of thousands of logarithms. Yet in all these minute details the tunnels were driven till they met between Baker Street and Piccadilly without the deviation of an inch on the part of the engineers' calculations, or on the part of the contractor's workmen in carrying their instructions into effect. We believe that this example of the brainwork that lies behind the slightest details of the magnificent whole we have so imperfectly described is a crucial instance of its importance, and its difficulties.

The general nature of the work on the District Railway we have indicated. It has been necessary to equip the line with third rails, to lead cable connections to the line for conveying current, to build transformer and sub-generating stations, and to complete the connections between these and the principal station. In addition there have been several important pieces of construction work at the existing stations, and at other points where the new tubes cross or connect with the existing track. Of these the most difficult has been that between the new station of Baron's Court and Earl's Court. Here the Piccadilly and Brompton begins to rise to a point where it becomes a surface railway and lies parallel to the District Railway. Here it had to be carried below the District line on what is known as the cut-and-cover principle. Great difficulty has been experienced in getting rid of the amount of water found lying here. While the work was going on the District Railway has had to be supported and carried on heavy timber work. Concrete walls have had to be built from the point where the depth between the two railways was not of sufficient weight and magnitude to support the uppermost one, and where the floor of the uppermost railway became the roof of the one underneath. It was here that the greatest amount of water came in—to complicate difficulties already great, and to make this one of the most ingenious pieces of engineering of the combined lines.

[We desire to acknowledge our great indebtedness to Mr. R. W. Perks, M.P., Chairman of the District Railway, to Mr. Chapman, Engineer-in-Chief of the Underground Railway Electrification, to Mr. Towle, Engineer of the Chelsea Power House, and to Mr. Haig, of the firm of Messrs. Galbraith and Church, Engineer of the Waterloo and Baker Street Railway.—EDITOR.]

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RELIGION IN THE NOVEL

A NOTE ON THE ETHICS OF FICTION—THE NOVEL IS NOT A PUPPET SHOW—IT MUST EMBRACE THE DISCUSSION OF PROBLEMS OF RELIGION BEFORE ALL THE REST—MARY MAGDALENE: AN UNFINISHED STORY AND WHY—THE NOVEL OF THE FUTURE WILL BECOME MORE AND MORE THE RELIGIOUS NOVEL

BY

HALL CAINE

AUTHOR OF "THE PRODIGAL SON," ETC.

A YOUNG Welsh revivalist preacher, who is now firing his country with such religious zeal as seems almost to justify the conclusion that another Wesley has come to Wales, was recently induced to tell the story of his call, when, among other things interesting to all of us, he made one remark that is of peculiar interest to me.

"I was not always like this," he said. "Once I liked novels. Now it is peace that I love most of all, for the Spirit has baptized me."

It would be easy perhaps to break some small witticism on the fiery enthusiast who explains his conversion with so much naïveté, but I feel no temptation to attempt an intellectual encounter at once so worthless and so cruel. Looked at beneath its rather innocent surface the young Welshman's statement means a good deal which none of us who devote our lives to the making of fiction can afford to ignore, still less to sneer or laugh at. It means not merely that novels may be of pernicious influence (although of course it includes that idea), but also, and mainly I think, that fiction as such is a trivial thing to occupy the mind of man in the face of the stern facts of life. It says in effect, "With all the burning realities of Time and Eternity confronting him, how can man waste his interest on the shadows of people who have never existed and incidents which have never taken place?" That is an attitude towards imaginative art which dates back to the birth of it; and although one might have expected that such a book as *The Pilgrim's Progress* would have dealt a death-blow to the idea it formulates, the idea still lives and operates powerfully on many minds that would be afraid to express it with the crude candour of the Welsh preacher.

In addition to this attitude of objection to fiction as fiction, there is also in many other minds a still more fierce and deeply rooted antagonism, based on what are supposed to be the withering influences of imaginative literature on the emotions of the people who use it as a principal part of their intellectual food. It is said, not altogether without show of reason, that fiction and the drama, which live by playing upon the emotions, do not stimulate and strengthen, but enervate and exhaust them. Thus it is urged that the people who weep most over the imaginary woes of the hero or heroine in a novel or on the stage have fewer tears to shed for the troubles of suffering people in real life; and therefore that the novel and the drama, in degree as they increase in influence, weaken the spiritual bone and sinew wherewith man has to contend against the everlasting pains of existence. One would have thought that this objection also had received its death-blow ages ago from the purpose which prompted the early Morality Plays; but it still exists, and I count it among the chief forces which constitute the antagonism to the stage which survives in those denominations of the Christian Church, like the Wesleyan, that most nearly approximate to the spirit of Puritanism.

But over against both these forms of objection to the novel there is another, which also exists in its strongest forms in the religious mind, and yet is their direct and complete contradiction. I mean the objection to fiction in its ethical claims and pretensions, urged by those who appear to hold that the novel is not merely to be accepted as a puppet show, but is only to be tolerated in that character. Speaking out of my experience of the more than favourable reception of a recent novel, I may say that among my clerical critics some of the most whole-hearted and generous are those who

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have most resolutely closed their eyes to any indication of higher motive in my book than that of the story-teller who aims to tell a simple story. According to such critics the public do not go to the novel for guidance in any ethical or religious difficulties. They take a novel through and through for what it undoubtedly is in its primary character, a story and nothing more. One would have thought (not to speak it irreverently or to bring small things violently into juxtaposition with large and sacred ones) that the parables of Christ themselves would have dealt for all time a death-blow to the idea that the very simplest fictitious narrative may not, without violation of art, be made a vehicle for the exposition of eternal truths. But certain it is that in a large class of by no means the least intellectual section of readers, the idea still exists that the novel is a puppet show as unmoral as "Punch and Judy," and as completely devoid of moral responsibility. It will not surprise that part of the public which has done me the honour to look at my own novels, that I rebel with all the strength of my soul against this latter form of objection, and that I think it immeasurably more prejudicial to the art of fiction than the utter antagonism that was crudely expressed by the fervent Welsh revivalist.

Let me say at once in answer to a question which the Editor of this magazine puts to me on what is supposed by certain readers to be my own false principle as a novelist, that I do not at all think that a novel, if it is to be good and right, can ever be a conscious amalgam of fiction and religion, or that the novelist who has any sense of art can at any time allow himself to "mount the pulpit, give out the text and preach a sermon." If the writer of fiction, while in the act of writing, is not wholly occupied by the human story he is telling—the joys and sorrows, the loves and hates of his characters—the result will be a bad novel. If he does not see the imaginary life he is describing so singly and so intensely that the real world with its social problems, its politics and its religion, has but a visionary existence compared to it, his work will not be fiction. If he does not find himself thinking of his imaginary creatures as if they were flesh and blood beings, and only concerned to look into their heart of hearts so as to make their conduct right and their emotions true, he can be perfectly sure that he is not a story-teller. He may be a critic, but he is no creator; he may be a preacher but he is no novelist. Yet while this is so, it is also certain that fiction, which is the most flexible of all forms of literature, may and almost must embrace the discussion (in one form or other) of nearly all the problems that confront the life of "the great man, mankind," and the problems of religion before all the rest.

The place of religion in the novel seems to me a subject of little difficulty, although it has been a cause of much disputation. When I say that among my own warmest friends and upholders the staunchest and most prominent have been ministers of religion, I shall be acquitted of personal feeling if I add that the shallowest chatter which has taken the form of objection to religion in the novel has usually come from clergymen. One clergyman in particular, a priest whom I shall not further indicate than to say that he is a novelist himself, has, with as little logic and insight as loyalty, *esprit de corps* and even sense of professional courtesy, attempted again and again so to hold up to ridicule the work (no doubt faulty and imperfect) of brother novelists who have challenged the right of fiction to concern itself with religion, as to convey the idea that the two are eternally divorced. One might expect to be forgiven if one were to retort that the only defensible ground of divorce between fiction and religion would be, in too many cases, the closeness of their affinity, but I prefer to defend their union on the ground of compatibility.

The religious novel has various developments. There is, to begin with, the simple one which finds illustration in books like *Scenes of Clerical Life* and *Silas Marner*, not to speak of *The Scarlet Letter* and the almost forgotten *Adam Blair*. It is difficult to imagine that a reasonable person can object to this elementary form of the so-called religious novel, or see any reason in the fitness of things why scenes of clerical life in any of their phases should not be as proper material for the novel as any other aspects of life whatsoever.

Another development of the religious novel is that which concerns itself not merely with professors of religion as a part of human society but with religion itself and the work of the churches as factors in the human comedy. It may be objected to this employment of the novelist's art that it lowers the temperature in which religion and its recognised leaders and professors have to live and work, and I am so far in sympathy with the objection as to see that the greatest artists never have permitted themselves to deal with sacred subjects and the sacred professions otherwise than sparingly,

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with reserve and with respect. Exception may perhaps be made in favour of Chaucer and Boccaccio, in whose pages monks and priests are sometimes treated with scant reverence and made the butts of ridicule and even the objects of contempt. But speaking broadly, I think it would be true to say that in Shakespeare, in the Elizabethan dramatists generally, and even in the best of the early English novelists as well as the greater novelists of Italy (including the greatest of them, Alexander Manzoni), the religious professions and religion itself are made to live in an atmosphere of reverence. On the other hand it may surely be urged that the place of religion as a force in life and the sincerity or the insincerity of its professors are legitimate subjects for treatment in any form of imaginative art which pretends to picture life as a whole; and if this involves, as it sometimes does, such scathing exposures of hypocrisy as were made by Dickens and by Charlotte Brontë (to speak of no others), the net result can only be good for religion itself, inasmuch as it must help to purify religious life.

Speaking again as one whose intimate friends are among the members of the clerical profession, I will venture the opinion that in the qualities of sincerity, purity and self-sacrifice, they are neither much better nor worse than almost any other class with which I have been brought into close relation, including even the much-maligned class of actors and actresses who live perhaps under influences of more temptation and without the constant stimulus of ennobling associations. And if it be objected that whatever clergymen are as a class, whether as fervent and sincere as the hero of *The Cloister and the Hearth*, or as cruel and vindictive as the black-coated monster in *Jane Eyre*, it is not well to lower the atmosphere of reverence in which the clergy should be held, I would answer that no good result can come to whatsoever things are true, whatsoever things are honourable, whatsoever things are just, whatsoever things are pure, whatsoever things are lovely, whatsoever things are of good report in the religious world by concealing or putting a gloss upon the things that are untrue, dishonourable, unjust, impure, and of evil report.

A third development of the religious novel is that in which fiction is used as a vehicle for discussing dogma and the relative merits of different faiths. This must needs be a limited exercise of the novelist's art and one which would certainly never commend itself to me, being entirely beyond the limit of my own powers as a story-teller. But I am well aware that more than one novelist in recent years has achieved success in this direction; and who am I to say that the limitless genius of fiction is not capable of embracing even a motive so difficult and apparently so foreign to its natural character?

A fourth development of the religious novel is that which takes incidents directly from Scripture and expands and heightens them by the addition of other incidents and fuller characterisation. This is a form of fiction which has found more favour across the Atlantic than in our own country, where it is felt to partake of licence and irreverence, and, furthermore, to be open to the objection that no writer, whatever his gifts, can hope to touch without injuring the characters and scenes that are sacred to memory in the form in which they have come down to us.

If I may be pardoned a personal reference in this connection I will say that I have on more than one occasion gone to the Bible for the foundation on which I have laid the superstructure of my story, and no one can be so conscious as I am that for any favour with which my novels have been received, and for any promise of life which some of them may give, notwithstanding their many imperfections, I am indebted to the fact that I have laid them on the bed-rock of the great legends which have endured almost since the beginning of the world, instead of trusting to any poor effort I might have put forth to invent stories for myself. But once indeed I was so captivated for a little while by what may be called the American development of the religious novel that I attempted a story with the pathetic and inspiring person of Mary Magdalene for its central figure. That story never got itself completed. Before I had gone far I had realised the fundamental difficulty of any enlargement of the beautiful theme without disturbing preconceived ideals and alienating settled sympathies. It was the same difficulty for me as a novelist as that which the painter of sacred subjects always encounters, but it was intensified a hundredfold by the necessity for amplification upon the lines of the sanctified original. My story of Mary Magdalene shall never be finished and it shall never be published: but I am far from sure that the genius of fiction in the time to come may not in better hands secure for the novel such a triumph over scriptural themes as the masters of pictorial art

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have in a few instances achieved. With two such great examples already known to literature as Byron's tremendous *Cain* and the *Joseph and his Brethren* of Charles Wells, it would not be rash to make such a prediction; and indeed the loss of authority, dignity and power which a remarkable modern writer, Mr. Stephen Phillips, seems lately to have suffered in bowing, as he needs must, to the necessity of altering the venue of his latest play on the thrilling story of Uriah the Hittite points to the urgent need of educating ourselves to a more liberal attitude towards the imaginative treatment of sacred subjects.

Finally, there is a development of the so-called religious novel which deals neither with the scenes nor characters of the religious world, nor yet with religion itself whether as dogma or as a force in life, but with the religious sense in man, the feeling for the supernatural, the consciousness of God's governance of the universe, and that deepest of all questions the meaning of life. This is a form of religious *motif* whereof all novels worthy of the name must in some measure partake, inasmuch as every picture of life in degree as it is true will always challenge such subjects. The marvellous but everyday realism of a *Robinson Crusoe*, as well as the romantic excursions of a *Monte Christo*, no less than the psychological analysis of a *Scarlet Letter* or of a *Resurrection*, will be found to make its declaration sometimes clear and emphatic, sometimes fumbling and stammering, on the great paradoxes of religion and life.

And in order to write a religious novel of this broadest character it is first of all necessary that the novelist should be a man who has lived much, felt much, read much and thought much, and with that equipment has set about to use his own vehicle in its only legitimate way, not as a sermon or philosophical treatise but as a parable wherein his mind is above all things fixed upon the fact, knowing full well that Nature seen as a whole by one who has the true sense of life cannot fail, whether the writer is conscious of it or not, to express the little that may have been revealed to him as to the way of God with man.

If I may be forgiven by the reader for referring to the personal experience which more particularly prompted the Editor of this magazine to invite me to write the present paper, I will say that during the writing of my recent novel the consciousness of religious problems was hardly ever present to my mind. Never for a moment in the production of that book did it occur to me to mount the pulpit, read a text, and deliver a sermon. When I brought the book back from the Engadine, where it was put together, I told my friends that I had written the simplest of all possible stories, a story so simple that it could not be simpler without descending to the level of a "bairn's book." But I cannot pretend to any surprise that so much discussion on tremendous topics has arisen out of the simple sooth of my homely fable, because I knew from the first that I had laid it on the foundations of an original which sounded the utmost depths of thought and emotion. That characteristic, indeed, of the words of Christ which concerns at once their extreme simplicity and great profundity above all the teachings of other men would, of itself, I think, be sufficient to satisfy me of the Divinity of the Teacher; and therefore I see that any treatment whatever, however faulty, of a theme so pregnant of thought and feeling as the parable of the Prodigal Son must have challenged controversy on every side.

I am not surprised to hear that a story based, however freely, upon a parable in which, as Renan says, "he who has fallen is represented as having a sort of privilege over him who has always been just," should raise afresh the question of whether we are punished and rewarded according to our deserts, and whether the eighteen on whom the tower of Siloam fell were not sinners above the others in Jerusalem. Neither am I much astonished that ardent evangelical Christians like the Rev. Dr. Clifford preaching on the book a few days ago should object that in the emphasis I give to the doctrine of doom, "The wages of sin is death," I overlook the message of hope in the words, "Thy sins are forgiven thee." In this regard I speak as one of the commonalty who know nothing of theology when I say with Harnack that the pulpit relies too much upon redemption, forgiveness of sin and justification, if it does not emphasise equally the natural impossibility of undoing the evil that has been done. Dr. Clifford knows better than I do that the doctrines of "objective redemption" have been the occasion of grievous temptations in the history of the Church, and, if a layman may dare to say so, the theory of "conversion" as it is taught in these days by nearly all the evangelical branches of the Christian Church, from the Roman Church to the Salvation Army, seems to be in danger of concealing the true meaning of religion in so far as it allows itself to adopt that free and easy attitude to

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past transgressions which has always been a snare.

I apologise for this incursion into theological controversy, and return to my argument that the novel will be religious in the highest and best sense just in the degree in which it is permeated by the sense of life. In this way I think the novel of the future will become more and more the religious novel, that it will only be accepted, whether by the ploughman or the philosopher, in the degree in which it unites with the simplest pictures of human life the deepest problems of humanity.

I think this is the great hope for the novel of the future, and I would not be understood to say that in any degree it excludes what is called the romantic novel or the novel of adventure, or that it claims for fiction a conscious metaphysical or religious intention. I think the people writing novels in the time to come will be the best minds, the richest natures, the strongest souls. I think it will be realised that the capacity of the novel for any work whatsoever, whether of simple entertainment or of deep teaching, is entirely without limit; that there is no vehicle so capable of reaching a wide area; no medium so adaptable to the needs of man in all his stages of intellectual development; in a word that there is no pulpit with a sounding-board that will send the human voice so far.

If this is thought to be a glorification of my own art I shall expect to be forgiven for it if only on the ground that a man is bound to praise the bridge his faltering feet have crossed over, and that I know full well that with my limited possibilities I could not have expected to go even so far if I had used any medium less pliable and popular than the novel.

"PROTECTED" WORKERS AND HORSE-FLESH

I. IN GERMANY

A RECOGNISED ITEM IN THE NATION'S FOOD-SUPPLY — THOUSANDS OF GERMANS ARE DRIVEN BY STERN NECESSITY TO EAT HORSE-FLESH — EIGHTEEN HUNDRED AND EIGHTY-FOUR TONS CONSUMED IN BERLIN DURING THE PAST YEAR—DOGS AS FOOD FOR THE VERY POOR

BY

OUR BERLIN CORRESPONDENT

WHEN the saying of a famous chemist that the consumption of soap among a nation was the surest measure of its civilisation was reported to Ferdinand Lassalle, he replied that the nation's consumption of beef was just as unerring a standard. At the time this was said Germans were seething with discontent, and their consumption of beef per head of population was extremely limited. Their bread was almost exclusively made of rye meal and the flesh they ate inferior and limited in quantity.

During the forty years which have elapsed since Lassalle founded German Social Democracy the population has made vast strides in wealth, but it is questionable whether this wealth is as equally distributed as it once was. I am rather inclined to believe that Herr Bebel is right when he declares that as the wealthy are growing wealthier they are throwing to the bottom an increasing precipitate which also grows poorer, a submerged proletariat in fact.

Probably one of the safest proofs of the existence and increase of this submerged proletariat is found in the use of horse-flesh as human food. There are other proofs to which I would like to return should THE WORLD'S WORK grant me the space, but at present let us look at this question of horse-flesh. The

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statement that horse-flesh is used in Germany as human food has been contradicted on all sides, especially by those who seem to take a pleasure in holding up Germany as the paradise of the worker, and the bright and shining example which England should follow in her fiscal policy. Horse-flesh is a recognised item in the nation's food-supply. There are thousands of Germans who rarely indulge in any other flesh food, not because they like it particularly, but because they are driven to use it by stern necessity.

Let us take Berlin, the capital of the Empire. Here wealth is centred, and vast industries have been established. As in London so here enormous areas of the city are occupied by working men, and it is almost exclusively here that horse-flesh is sold for human consumption. Only in one other place is it used to any extent —the Zoological Gardens.

In the Greifswalder Strasse there is an authorised horse slaughter-house. It is under police inspection, and a veterinary authority is on the spot to see that no horses are killed whose flesh is unfit for human food. Sanitary arrangements are excellent, and everything is done to keep the flesh as pure as possible. In 1894, ten years ago, the number of horses slaughtered in Berlin for human food was 7627. In 1900 it had risen to 10,185. In 1903 the number was nearly 12,000, and I am informed that in this year the number will not fall far short of 13,000. The use of this food is therefore increasing at a more rapid rate than the population. If we take the quantity of available flesh in a horse's carcass as 230 pounds, we have the astonishing result that Berlin will consume this year 3,220,000 pounds, or 1884 tons, of horse-flesh. There are sixty-four meat shops in Berlin where nothing else is sold than horse-flesh. There is no attempt at concealment. The dealer paints his windows and shop front with staring letters announcing the fact shat he sells excellent horse-flesh, and the finest sausages made of this flesh.

As far as I can judge from the information in my possession, the consumption of horse-flesh in other districts of Germany where the population is not so well off is greater than in Berlin. If we take the fairly prosperous city of Breslau, the capital of Silesia, we find that last year 3800 horses were killed there for human food. As Breslau has a population about one-fifth that of Berlin, it is evident that the consumption of horse-flesh in the Silesian city is about double what it is in the Imperial capital. In parts of Saxony, the heart of industrial Germany, it is about three times as great as in Berlin, and in some South German districts it is even more.

The best pieces of the horse are the under-cut and the tongue. These sell in Berlin for 35 to 40 pfennige (4*d.* to 4½*d.*) per pound. Other pieces off the hind-quarters average 25 to 30 pfennige (3*d.* to 3½*d.*). Meat cut from the fore-quarters, or from lean horses. which are used for making the garlic sausages so popular among the very poor, is sold for 12 to 15 pfennige (1½*d.* to 2*d.*) a pound. A horse's liver is regarded by many German working men's families as a great delicacy. It fetches 40 pfennige (4½*d.*) a pound. A horse's brain has rather a peculiar taste, and lacks the delicacy of the pig's or calf's brain. Its price, however, is low—only 35 pfennige (4*d.*) for the entire brain. The refuse pieces, which even the garlic sausage manufacturer cannot use, are sold for 10 pfennige per pound as cats' meat.

I have been asked, Is dogs' flesh used in Germany as human food? I am afraid I must reply that it is. I have no definite statistics, but I have been told by a competent authority that last year's report of the slaughter-houses of the large Saxon town of Chemnitz mentioned that some hundreds of dogs had been slaughtered there and elsewhere for food for the very poor, and that he was quite certain the practice prevailed in other destitute areas of the Empire.

To one very important matter attention ought to be directed. In Berlin large quantities of horse-flesh are manufactured into sausages, worked up with pork fat and deftly seasoned and spiced. If these sausages are sold in Berlin the local police regulations demand that they be marked "Horse-flesh." But this wholesome regulation has no force outside Berlin. The result is that enormous quantities of horse-flesh sausages are exported from Berlin to other towns, for example, Hamburg, Frankfurt, Gotha and so on, and from these towns are sent abroad—to England among other countries—as perfectly legitimate pork sausages. The price of the meat with which these sausages are packed is so low that they can easily bear the expense of transit, and yet leave a very large margin of profit for the dealer.

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II. IN FRANCE

FORTY THOUSAND HORSES EATEN BY PARISIANS EVERY YEAR—PRESCRIBED BY DOCTORS—TWO HUNDRED HORSE BUTCHERS ON THE OUTSKIRTS OF THE CITY—HORSE-MEAT IS GROWING STILL MORE POPULAR, AND IS HALF THE PRICE OF BEEF OR MUTTON

BY

OUR PARIS CORRESPONDENT

FORTY thousand horses represent the annual consumption by the Parisians of horse-flesh as an article of diet. Prodigious, is it not? It has increased lately at an extraordinary rate. The eating of horse-flesh really dates from the Siege of Paris. Then the famished inhabitants slew every available horse within the walls of the city, leaving barely sufficient for the mounted troops. Indeed, the *menus* that have been preserved of that dreadful time bear witness to the fabrication of dishes far less edible—dogs and cats and even rats figuring on the tables of the very rich. Nowadays, the eating of horse-meat has taken such an extension that there are no fewer than two hundred butchers established on the outskirts of the city who deal exclusively in equine "cuts," the "joint" being unknown in French households. The last decade has witnessed the greatest development, and every day the purveyors and the consumers of horse-meat increase in numbers. One reason is that doctors have begun to prescribe that kind of diet for invalids, especially for tubercular children. The juice of the meat is accounted more nutritious than that of beef or mutton.

Horses are slaughtered in the same way as bullocks, in a large *abattoir* situated in the Gobelins quarter. The space, however, at the disposal of the slaughterers is becoming inadequate in view of the constant extension of the traffic, and new buildings have now been constructed in a suburb of Paris known as Vaugirard, which will be opened at the beginning of the year. The authorities anticipate that the already vast total will presently be considerably augmented. The greatest precautions are taken to prevent diseased meat from being sold to the people. The surveillance is stricter than in the case of sheep or oxen, because the temptation of the peasantry to turn to account their used-up and disabled horses, which may have some organic malady, is regarded as especially great. Five veterinary inspectors, therefore, keep constant ward and watch over the horses brought into the *abattoirs*. A police officer posted at the doors of the public slaughter-houses requires the stamp of the Prefecture of Police upon the hoof of the condemned quadruped before he allows it to pass.

The Government have taken the slaughtering of horses for food under their especial care. The *octroi*, which amounts to as much as twelve francs a hundred kilos (2 cwts.) in the case of cattle, is remitted in favour of the horse, which passes in free. Time was when England was scoured by the horse-butchers of France to supply meat for the shops. That is the case no longer, or only to a small extent, because the Government, yielding to the cry of protection from the home farmers and graziers, imposed the severe duty of 150 francs (£6) per head. As a consequence, it is no longer profitable to import horses from across Channel, as the entrance tax, as well as the cost of transport, has to be paid. English horses were sought after by the trade because they are generally larger and fatter than those of French breed.

Certain districts in France, particularly in the Department of the Nord, famous for its breeding farms, are almost denuded of horses, so great is the demand of Paris and some of the large provincial towns. From time to time one hears complaints of the lack of animals for farm-work because the prices ruling at certain times of the year make it more profitable for the peasant to sell Rosinante than to keep him for the plough. The custom now is to sell off the old horses after seed-time in the autumn, when the best prices can be obtained, and to buy yearlings in the spring. In the winter months there is always a greater demand than at other times. I have before me the figures for the months of this year (1904), supplied by

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M. Jacqueau, of the Boulevard de la Gare, the largest hippophagic dealer in Paris. Beginning with 1163 horses killed in January, the total reaches 1263 in March. There is a decrease in the hot weather until in July the number falls to 977. In September it jumps again to over twelve hundred, and in October the army of the slain is represented by 1274. During one day in the month of November, M. Jacqueau killed 150 horses.

The price varies very considerably. A medium price for a horse in good condition is 250 francs (£10), but it may rise to 260 or 280 francs. Again, an animal that has been hard-worked, one of those sad, decrepit and emaciated brutes that one sees so often between the shafts of a Paris *fiacre*, would not be worth more to the speculator in butchers' meat than fifty or sixty francs. The unedible parts of the horse mean an addition to this sum, the hide fetching a sovereign or so from German factors, who buy for saddlery and other purposes, and the hoofs also representing a small set-off. There is little question of breed in considering the "friend of man" from the point of view of the table. All breeds, whether Hungarian, English half-bred or Norman, come alike to him who examines "points" from a quite other view than the owner of a stud. But there is this to be said: blood tells to a certain extent, even when the destiny of the horse is so inglorious as the grill and the frying-pan. A pure-bred horse has less fat and more lean on his bones (consequently possessing an additional value to the butcher) than the four-legged creature whose parentage has little to recommend it. It is curious that white horses possess a special drawback. When the meat is cut up it is found to contain black formations, almost like a giant truffle, and known as hæmorrhoids, which have to be carefully cut away before use. Otherwise the meat is quite good, the surrounding parts not being affected. A butcher always prefers to buy the town horse, if in equally good condition, to the country horse. The reason is that the town "trotter" feeds on oats, which make his flesh white, whereas his country brother pursues a herbivorous existence. One need hardly say, perhaps, that the entire horse is as unsuitable as the bull for human consumption, the meat being full of "nerves."

But the prime reason for the popularity of horse-flesh in the French capital is the obvious one of its cheapness. It is half the price of beef or mutton. A working man can buy a *livre* (1 lb. 1 oz. 10¼ dr. avoirdupois) for 50 centimes (5*d*.). That is to say, that he and his family may eat meat every day for a sum under three shillings a week. Comparative prices are shown in the following table:

	Beef. s.	d.	Horse. s.	d.
Fillet	2	1	0	11
Undercut	1	6	0	8
First ribs	1	3	0	7
Collop	1	2	0	8
Rump	1	1	0	7
Shoulder	1	0	0	7
Neck	0	9	0	5

Average price without bone for half kilo = 1⅛ lb.

Notwithstanding the vogue that the hippophagic butcher has in Paris there is still a considerable prejudice against the consumption of horse-meat. Every butcher is compelled by the law to signify clearly that he sells horse. and to this end his shop front is always distinguished by a gilded horse's head—neither is he allowed to sell in the same establishment beef and mutton; but no restaurant dare label itself as supplying horse-meat to its customers. It does not require, however, a very vivid imagination to suppose that a great deal of horse-flesh is sold as beef. Nor, when the flesh of the former is good, is it easy to distinguish. The meat in appearance is generally darker coloured, but it is not necessarily less tender. That depends upon its origin. A horse that has been badly used and too hard-worked will be tough and "stringy," but not the animal taken from a *bourgeois milieu*. As I have said, considerable prejudice exists on the subject, and none but the working classes have, up to this moment, conquered their repugnance sufficiently to enter the shop at the sign of the horse's head. That, however, does not prevent a certain number of persons in well-to-do circumstances in Paris from supplying themselves, through their family butcher, with an occasional steak from the hippophagic purveyor. It is possible that the movement may make some progress in those classes of society removed from the labourer and hand-worker.

To promote the hippophagic propaganda there exists a society in Paris meeting yearly at a banquet. The dishes on that occasion are entirely composed of parts of the horse, as also of the mule and of the ass, those humbler servants of mankind being consumed to a certain extent by the French proletariat. Horse sausages are freely eaten by the poor. and their resemblance to the original product of Arles and Lyons is so great that if one is to believe report they are often substituted by the dishonest trader concerned for a greater profit.

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THE MARCH OF EVENTS

MR. BALFOUR AND MR. CHAMBERLAIN — THE TRADE RETURNS — EMPIRE AND COLONIES—THE FUTURE OF THE WAR

BY

HENRY NORMAN, M.P.

IN domestic politics there is a lull before the breaking of the storm when Parliament meets in February. Mr. Balfour took advantage of the temporary Anglo-Russian crisis to keep silence at Southampton upon the situation as between himself and Mr. Chamberlain, and this silence he has preserved ever since. The position is not a dignified one for a Prime Minister—the one man in the country whose views upon a great national issue ought to be known to all. In the Japanese system of self-defence there is a manœuvre by which when an opponent attacks you, you grasp him by the hand, draw him violently towards you, and thus neutralise his attack. This is precisely what Mr. Chamberlain has done to Mr. Balfour. The Prime Minister appeared to us all in his Edinburgh speech to be attacking Mr. Chamberlain, but the latter cordially seized his hand, welcomed his proposals, and forcibly drew him to himself. Thus the attack, if it were one, failed. It is too much to expect that Mr. Balfour will interfere with the holidays by returning to the charge, but perhaps the debate on the Address, when Parliament meets, will bring him out into the open. If this be an optimistic expectation, then we must wait for the Budget—a nasty fence for the Government to get safely over. Still, if Mr. Balfour is absolutely determined that his attitude towards the ex-colleague who has captured the whole machinery of his party, who is using this machinery without scruple to forward the success of his own views, and who has driven the cream of the party from its ranks—as shown by the remarkable list of names of the new Unionist Free Trade Club—shall remain a secret sacredly guarded in his own bosom, I know of no means by which he can be forced to disclose it. He will have done what no Prime Minister ever ventured to do before, but in this case precedent appears to have no weight with him. It seems about time for the business men of the country, irrespective of party, to declare that they are being too severely handicapped by the uncertainty which hangs over them.

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The trade of the country keeps up in a manner which is as gratifying to the rest of us as it must be distressing to Mr. Chamberlain. In spite of his confident prophecies—all his prophecies are confident—the year bids fair to overtop the record, and the trades which he described as "going" are perhaps the most flourishing. Cotton, wool, tin plates, galvanised sheets, are all in the most flourishing state—splendid proofs that Free Trade supplies the conditions under which an industry temporarily depressed can most quickly recover. Nevertheless, the Budget prospect is a most gloomy one. Lord Welby, who speaks with authority second to none on this question, has just expressed the opinion that there will be a deficit of between four and five millions on the top of last year's deficit of £5,400,000, and in spite of the fact that our revenue remains swollen by war taxes. We might in prosperous times, he remarked, fairly reckon on a natural increase of revenue amounting to £2,000,000. The limits of safety were passed when the increase of expenditure outstripped this extent of natural growth of revenue. But instead of an expenditure of £113,000,000, which our natural increase of revenue could have met, we had now an expenditure of £152,000,000. To the extent of the difference of these two sums the present Government have violated the cardinal rules of finance. "No war taxes upon articles of consumption," should be, he declared, a Liberal cry at the next election, and "another thing the Liberal Party ought to do when it obtained power was to denounce, at the first opportunity, that ridiculous, monstrous, and disgraceful Brussels Convention, which was an object-lesson of the folly of trusting an ignorant body of men with an opportunity of tampering with the trade of the country."

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With this every Liberal will agree. The Brussels Convention has taken at least £10,000,000 out of the pockets of the people of this country, it has closed a dozen confectionery factories and turned their workmen into the street, it is establishing in Switzerland what was a flourishing British industry, it has caused Russia to retaliate by increasing the duties on Indian tea, it has increased the consumption of sugar on the continent by 889,000 tons (an increase of 54 per cent.), and decreased our consumption by 50,000 tons, it has raised the price of sugar by a halfpenny a pound and caused the disappearance of some of the cheap luxuries of the poor—and all this under the very plea of making trade stable and "cementing the Empire," which are Mr. Chamberlain's grounds for asking to be allowed to tax food and manufactures. It is a most valuable object-lesson—a "working model of protection." Bad as its results are, they would be but a flea-bite compared with the results of the policy of the "tariff-reformer," and we may at least be grateful that the country has had this striking and unmistakable warning.

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Both Sir Henry Campbell-Bannerman and Mr. Asquith—whose record of political work during the last year can seldom have been equalled for either quality and quantity—have made excellent speeches during the month, but the most striking public utterance has unquestionably been that of Lord Rosebery at Glasgow, to a meeting of almost unparalleled enthusiasm, to which, by the way, a cordial message from Sir Henry Campbell-Bannerman must have contributed more than a little. The speech showed all the qualities of the finest speaker of our time at their best. It was direct, humorous, witty, profound, and impressive by its patriotic eloquence. It has brought back to Lord Rosebery, within my personal knowledge, men who have believed themselves hopelessly out of sympathy with him for years past. So few busy persons read long columns of verbatim reporting that I am sure a few extracts will be new to many of my readers.

I was struck when in Canada at the beginning of this year by the evident fact that attention there was riveted on one side only of Mr. Chamberlain's policy. Lord Rosebery clearly sees this dangerous onesidedness:

"I am inclined to think that the whole of Mr Chamberlain's policy has not yet reached the people of Australia or of Canada. If I had any influence, which I have not, with those who transmit this news across the cables, I should ask them to transmit this authoritative sentence of Mr. Chamberlain's to Australia and to Canada. That sentence is this: 'Our colonial fellow subjects are growing every day in strength and power. We have hitherto borne alone the burden of our great Empire. We have to look to them to share that burden with us, as they have shared its privileges.' 'Share the burden with us!' I wonder if that has been put before Australia and Canada; and yet that is an integral part of the policy."

It is high time that the following sentiments should be more clearly appreciated in the further parts of the Empire:

"No one could suppose that any real Imperialist outside an asylum would come to the people of the United Kingdom and say, You shall bear the enormous expenditure of this Empire alone, you shall bear the burden of this Empire alone, and, in addition, I make the further suggestion that you shall tax your food on behalf of your well-fed kinsmen across the sea. Such a policy would have been wanting in balance, it would have been wanting in completeness, and therefore I am anxious that our colonial fellow countrymen, when they weigh the advantages or disadvantages of this policy, should know exactly what it means"

The peril to the British Empire which lies hid in Mr. Chamberlain's policy is hardly appreciated at its true gravity either at home or in the Colonies. Lord Rosebery has it deeply in mind:

"I believe that if you subject the Empire to the strain of these pecuniary interests all pulling at her in opposite directions, you will subject the Empire to a strain which that fabric is not calculated long to resist. The Empire is the most complicated and the most delicate of all organisations; but if you set on foot cupidities in every direction trying to get more and more out of the tariff for different Colonies, and for different interests, you will find that the Empire at last is drawn and quartered by these contending interests, and will not be able to resist the strain upon it."

With all the goodwill possible, and as devoted to the interests of the British Empire as it is possible for men to be, Free Traders at home should no longer hesitate, from any belief—wholly unfounded—that the people of the Colonies will resent "straight talk," to speak out clearly upon this question of the Empire, and the inhabitants of the United Kingdom. We pay about £30,000,000 a year (I am writing abroad, and quoting the figures from memory only) for the interest upon National Debt incurred, whether wisely or not, to build up the

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Empire. We pay some £70,000,000 a year (I believe Mr. Bowles calculates £100,000,000) for defence. The support of the Monarchy costs about £600,000 a year. The Foreign Office bill is some £65,000 a year, and that of the Colonial Office more than £50,000. Of this vast total of something between £100,000,000 and £130,000,000 a year the Colonies together pay about £300,000 towards the Navy—of which Canada contributes not a penny. Of what we have paid in blood, history tells. Is it not fair for us to say that the process of "cementing the Empire," if it needs cementing, should begin with a little trowel-work in the Colonies? Should they not be called upon to bear a share. proportionate to their numbers and wealth, of the cost of the public services which guarantee them safe and peaceful development? Should they not contribute something to the support of the Monarch who is also King of the British Dominions over-seas? There can be but one answer. Pride, loyalty, patriotism alike call for this. It is not consistent with their dignity as partners in the Empire to allow practically the whole vast cost of it to be borne by a people a large proportion of whom are less well off than themselves. The process of "cementing" should begin at the circumference. Most of all, we have given them, and keep secure for them, the most precious gift of all—freedom. It is inconceivable that in return they should ask us to tie our own hands. I am confident from my knowledge of Colonial feeling, which is as proud and as loyal as any at home, that when this sentiment of the home-land is realised by them, they will admit its justice and make a unanimous response. It is due to Mr. Chamberlain that for the first time Britons at home are led to regard the conditions of Empire from this unwelcome point of view.

* * * * *

Upon one other blight that a Protective system would certainly bring upon us, Lord Rosebery spoke with profound emphasis—namely, the growth within a tariff of huge capitalistic rings and the corruption they have created everywhere, and would assuredly create with us. He said:

"Only one thing is certain about that disastrous condition which prevails among the great countries of Europe and which is known as Protection, and it is this—that under its shade every sort of interest grows up, and when those interests have grown up they defend themselves to the death without scruple as to means and to instrument, without regard to public interest for a moment when weighed in comparison with their private interest; they stick at no weapons and no means, they corrupt constituencies, they corrupt municipalities, they corrupt Parliaments themselves. Sir, there is nothing that they will stop at to protect, to maintain, and to raise the tariff under which they derive their existence. . . . Gentlemen, I hate all tyranny, I loathe and detest it, but the tyranny that I loathe most is that of corrupt and corrupting wealth."

According to the *Times* report, these words were greeted with "loud cheers," and "prolonged cheers," a proof that the vast audience at Glasgow, at any rate, was alive to the danger so impressively denounced. In fact, Mr. Chamberlain's proposals add a new solemnity to one passage of the Litany and should bring a new fervour to the response: "In all time of our tribulation, in all time of our wealth, —*Good Lord, deliver us!*"

* * * * *

The war divides itself now into two parts, the siege of Port Arthur and the position of the two armies in Manchuria. At enormous cost—another of those fearful sacrifices of life to which they have shown themselves more ready than any army that ever took the field, the Japanese have captured a hill commanding the harbour of Port Arthur. The Russians with desperate gallantry retook it twice, but at last the Japanese remained in possession. The cost may be judged from the list of killed and wounded officers. One lieutenant-colonel, one major, three captains, eight lieutenants, fourteen sub-lieutenants and nine sergeant-majors were killed, and fifty-eight officers wounded. The great losses of officers are perhaps the most serious side of the war to Japan, as they cannot possibly be replaced by men of the same quality. Upon the captured hill, however, they speedily mounted big guns and have apparently destroyed all the larger vessels of the Russian fleet. Admiral Togo is thus left free to prepare to meet the Baltic fleet. Nothing is more amazing than that the splendid Russian fleet in the Far East, comprising the most powerful vessels, and the most trained *personnel*, and costing a colossal amount of money, should thus finally have been destroyed without ever having struck a blow—indeed, almost without trying to strike a blow. The most ignorant observer has seen that there was but one policy for the Russian fleet—to engage the Japanese and at any cost, every ship if necessary going to the bottom, to weaken the naval power of Japan,

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that the European reinforcements might regain the command of the sea. Their failure to attempt this passes comprehension. Vladivostok now remains the only possible base for Admiral Rozhdestvensky, and for my part I find it difficult to believe that he will proceed on his way unless the many rumours concerning the purchase by Russia of powerful vessels in South America should prove well-founded, and he should thus become in command of a fleet far more powerful than that with which he started.

In Manchuria the rival armies face each other along a front of many miles, and each is so strong and so well entrenched that apparently neither ventures to take the offensive. Critics on the spot anticipate that the winter will thus pass in inaction. On the one hand, this long forced truce should give time for counsels of peace to make themselves felt; but on the other the Russians naturally think that time is on their side, and that though without command of the sea they cannot hope completely to defeat Japan, a series of victories in Manchuria would reduce Japan to such a pass that she would be willing to make terms of peace which would leave matters at the end of the war not very different from the beginning. That Japan is experiencing grave disappointment at her lack, after ten months of war, of any immediate prospect of ultimate victory, seems clear, and the most careful correspondents report a state of national depression at the awful losses she has endured. Even Port Arthur, the fall of which has been regularly foretold every few weeks for months past, may yet hold out for a considerable time, and the conclusive victory in Manchuria is further off than after the first Russian defeat on the Yalu. A striking article (Dec. 5), by Mr. F. A. McKenzie, a correspondent of the *Daily Mail* who has been with the Japanese from the beginning, and who, it is claimed, has seen more of the war than any other correspondent, has just put in positive form the aspect of the war from the Japanese side which some of us foresaw from the first, but of which no news has hitherto reached us. "The war is now, in my opinion," he says, "at a stage more difficult for Japan than at any time since it began. In Japan, he adds, there are now considerably over 100,000 wounded men, and Japan's chief dangers he summarises as follows:

The growing improvement of the Russian *moral*.

The over-caution of the Japanese generals, and their neglect to follow up their victories fully.

The heavy losses incurred by the Japanese in direct attacks.

The fact that the Russians have now learned the surprise methods of Japanese attacks, and are prepared against them.

Lastly, and for the moment least important, the failure of the Japanese to placate the Koreans.

The Japanese plan has miscarried, he declares: "after every defeat the Russians have fought better than before"; Kuropatkin's severe discipline has eliminated the hopeless officers from the service; the three Japanese armies on the Sha-ho are "held up"; "the burden of the wounded is very heavy"—everywhere in Japan he has seen "the army of stricken soldiers"; he saw "monster temporary infirmaries in many districts," and "the temples were everywhere being turned into sick asylums"; and the Japanese have "succeeded in offending and exasperating the whole Korean nation," who "are now prepared to hail the Russians."

"The question inevitably arises—How far can Japan stand this drain of men? The tooth-comb of the conscription has already been drawn very fine through the country. The younger men have all been called to arms. The troops now going to the front are mostly older reservists, who have been longer from the colours. A hundred thousand men may fall in the next two battles around the Shaho. Russia will feel such loss heavily. Can Japan stand the strain? Each battle now grows bloodier than the last."

All this does not necessarily mean, of course, that Japan will be defeated in the end; but it gives cause, as Mr. McKenzie truly says, for "uneasiness" regarding our allies. Public opinion in England is now much more informed and much more sober than it was nine months ago, when it was egregiously misled by a section of the Press. It is a pity, however, that a little more attention was not paid to the few who knew both countries well, and expressed "uneasiness" from the beginning—indeed from the announcement of the alliance itself.

* * * * *

I have no space this month to discuss the new, important and welcome change in naval administration. I will only remark that it will not have come as a surprise to readers of THE WORLD'S WORK, for they will have seen it clearly foreshadowed on page 14 of the article upon Sir John Fisher's policy in last month's issue. The new First Sea Lord has got to work quickly. It is to him alone that we owe this great reform.

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THE MOST WONDERFUL BRIDGE IN THE WORLD

THE VICTORIA BRIDGE, ZAMBESI RIVER—A SINGLE, GRACEFUL SPAN OF 500 FEET—HOW IT HAS BEEN BUILT, AND ITS BEARING UPON THE "CAPE TO CAIRO" RAILWAY

BY

EUSTACE REYNOLDS-BALL, F.R.G.S.

FROM the professional or technical point of view this bridge is not, of course, anything very remarkable. It cannot, for instance, be compared with the Brooklyn Bridge, the Forth Bridge, the Lansdowne Bridge (Indus) or the new St. Lawrence Bridge (Quebec)—to mention some of the most famous that occur to me at the moment—as engineering achievements. This may be frankly conceded, yet it is indisputable that from the lay point of view the Victoria Falls Bridge possesses striking and even sensational features which are wanting in the world-famous structures above mentioned.

The peculiarity in the construction of the bridge is that owing to the great height above the water, the great depth of the stream and the precipitous banks, no staging or scaffolding could be used, so the cantilever principle has had to be adopted, the bridge being built simultaneously from each end until the arch meets in the centre.

The history of the bridge affords a valuable testimony to the enterprise and energy of the Contractors, the Cleveland Bridge and Engineering Company of Darlington, and the skill and ability of the Engineers, Sir Chas. Metcalfe and Sir Douglas Fox and Partners. If for nothing else, the celerity with which this great work will have been accomplished, renders it one of the most noteworthy engineering achievements of the century. It was begun little more than a year ago, and everything points to a conclusion early next spring. Indeed it may be regarded as almost certain that the bridge will be open for traffic in ample time for the visit of the British Association to the Zambesi River, next July.

The work has been carried out for the most part by natives, though the foremen, overseers, and, of course, the staff are English.

The method adopted by Mr. Beresford Fox. the Assistant Engineer-in-charge, was to fire a rocket across the river at the spot selected (which is just below the "Boiling Pot," as the entrance to the twenty-mile cañon is called) and to the rocket was attached a thin string. Next, a stouter string was sent across and finally a telephone wire. A telephone apparatus was required because the distance by going round from side to side was about ten miles, although the actual distance straight across is only about 200 yards. Next a marked steel wire was passed across, and a strain put on it, the strain being measured by means of a spring balance in order to compute the versed sine or "sag" of the wire. The total length of the bridge will be 650 ft., and this result coincides closely with the length measured two years ago. There will be three spans, two very short "approach spans" of unequal length, and the great central or main span of 500 ft. The southern span will be 87½ ft. and the northern one 62½ ft. A rough measurement, it is worth noting, was calculated from rail level to water level, and this was found to be 420 ft. This may be called low-water level, as the river is about its lowest in August, and high-water level will be about 40 ft. less, or 380 ft. This measurement will make the bridge the highest in the world, the nearest to it being the Viaduct du Viaur in France (which is just finished), which is 375 ft. above the bottom of the valley it crosses.

Every precaution has been taken to minimise the loss of life which bridge works of this magnitude too frequently entail. A huge net is hung below for the whole length of the bridge, in order that, as the contractors somewhat

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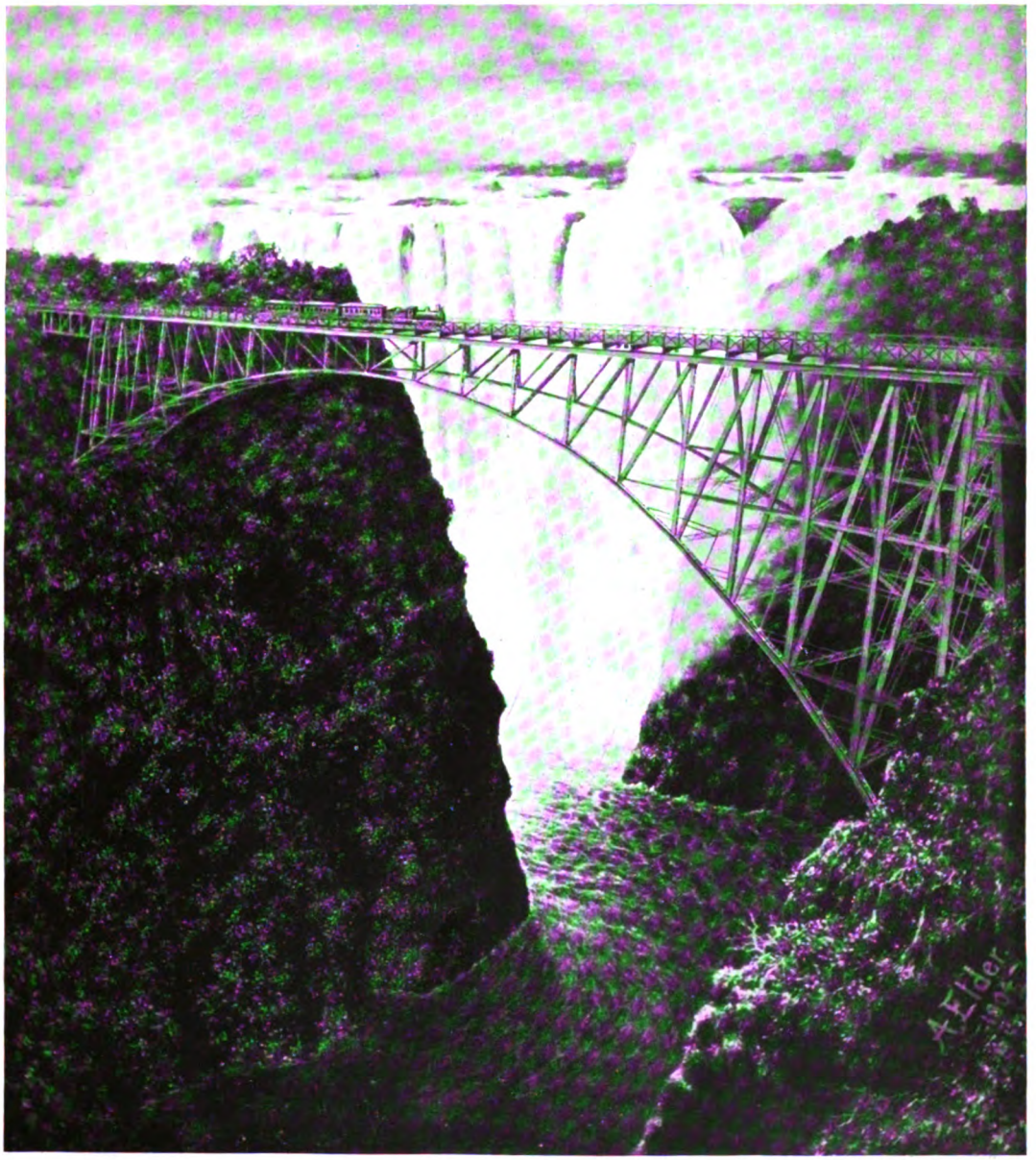
quaintly word it "boys and tools, should they inadvertently drop during construction, should be caught in it."

The following technical details may interest professional readers. They have been kindly furnished me by Mr. Arthur W. Elder.

	ft. in.
Span of main arch	500 0
Rise at crown	90 0
Depth of main arch at bearings	105 0
,, ,, ,, crown	15 0
Width between centres of main arches at top	27 6
Width between centres of bearings	53 9
Batter of main arches	1 in 8



From a drawing by A. Elder

THE BRIDGE ACROSS THE ZAMBESI RIVER, OVER 400 FEET HIGH

	ft. in.	ft. in.
Length of end spans	87 6 and	62 6
Clear width of roadway		30 0
The curve of the main arch is parabolic		
Camber of main arch at 60° (Fahr.)		9

I am also indebted to Mr. Elder's courtesy for the accompanying photograph which shows

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the bridge completed. It is not, of course, a direct photograph, but is one taken of the original picture of the Victoria Falls Bridge painted by Mr. Elder which was exhibited at the St. Louis Exhibition.

I have not ventured to attempt to describe the singularly picturesque and romantic scenery of the Victoria Falls. It would indeed be impossible to bring home to the reader the almost sublime character and scenic aspect generally. Nor is it necessary, as so many abler pens have already essayed the task, in which it is difficult not to fall into the snare of the superlative. Indeed, eulogistic epithets are apt to run riot should anything in the nature of a word-picture be attempted.

But the absolutely unique character of the Victoria Falls can be shown in a few words. The Zambesi River suddenly disappears into a precipitous cañon (nearly a mile long and in places barely 100 ft. in width) which runs at right angles to the river. The only exit is through a narrow cleft at the eastern end of this gorge. Then begins the remarkable series of zigzags by which the Zambesi serpentines its way through the cliffs in a chain of rapids.

As in the case of the Assouan Dam, many æsthetic objections have been brought against

F. W. Sykes

THE VICTORIA FALLS, ZAMBESI RIVER

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F. W. Sykes

"THE BOILING POT," BELOW THE FALLS

the particular site of the bridge, on the ground that it would be an eyesore in the wild and romantic landscape, and be unduly obtrusive. As a matter of fact these fears are groundless. In this connection the following letter from the *Times* may be quoted :

"At no point will the traveller of the future be able to see the falls from the windows of his railway carriage, except just as the train leaves the bridge and reaches terra firma on the northern bank, when looking backwards through a veil of drifting opalescent spray he will catch a short glimpse up the Boiling Pot, through the narrow opening at its head and straight against a small section of the face of the fall ; and lucky will he be if at that moment he should catch also a glimpse of one of the beautiful rainbows which come and go continually as the spray masses drift and swirl along the deep chasms.

"In itself the bridge will be, as your correspondent says, 'a spidery lattice-work' of girders ; very little masonry will be visible, no concrete piers, no tall towers, nothing, in fact, above the necessary railing. The whole design is of the lightest and most appropriate description, and will when completed give no reason for a charge of vandalism againt the Chartered Company.

"I have little hesitation in saying that, owing to the extraordinary conformation of the river bed below the Boiling Pot and the almost inconceivable roughness of the innumerable steep rocky clefts and gorges which run into the main cañon of the Zambesi, it would be almost impossible to approach the river, throw a bridge across, and find a practicable railway exit at any other point."

Then the bridge is of a singularly elegant design. Springing from the rock on either side, in a single graceful span of 500 ft., it cannot in any way impair the beauty of its surroundings.

The British South Africa Company, which owns the land on both sides of the river, is arranging to reserve a large area of the forest extending for some six miles on each side of the Zambesi as a public park, to be preserved for ever in its natural beauty.

It is, however, regrettable, though inevitable, that this scene of wild grandeur should be vulgarised by the chief features of interest

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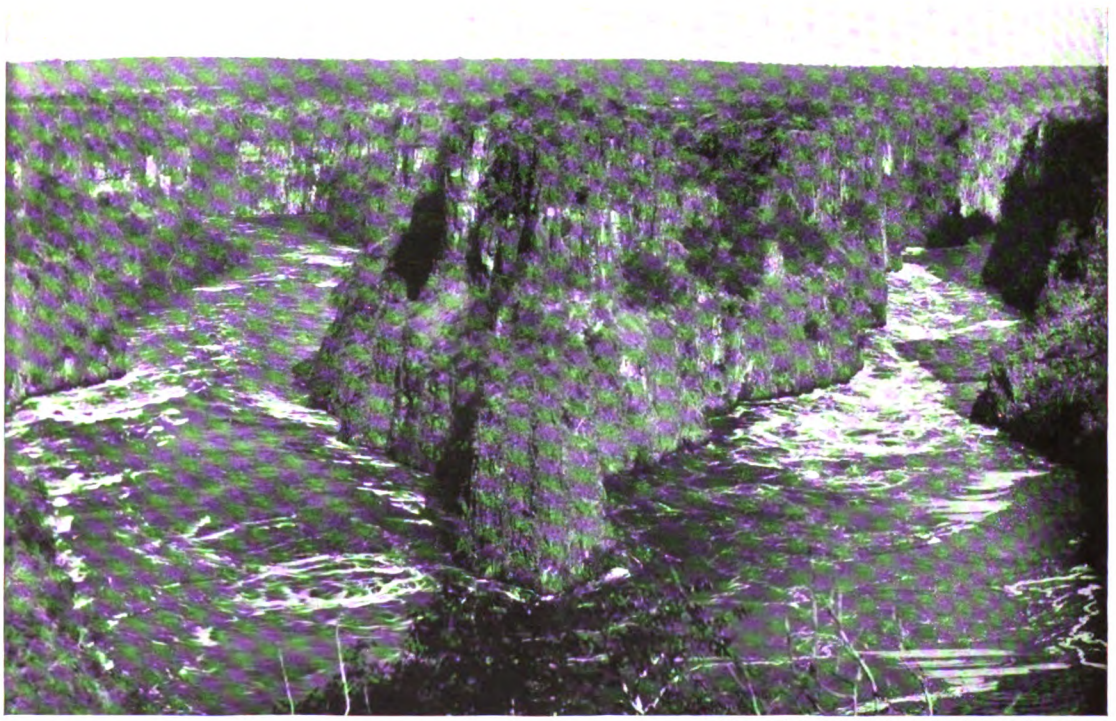
being saddled with puerile titles such as Devil's Cataract, Boiling Pot, Danger Point, Profile Cliff and even Lovers' Walk! Seeing the places dotted about with these conventional titles, the experienced traveller will not be surprised to learn that Cape Town capitalists have seriously begun to exploit the Falls as a tourist centre. A mammoth hotel "commanding unrivalled views" has already been begun, so that the tourist may "enjoy European luxury in the very heart of Africa" after his four days' journey by *train de luxe* from Cape Town.

This stupendous cataract is certainly the *clou* of the varied and magnificent scenery which will be enjoyed by passengers in what will probably be the most remarkable of the world's trans-continental railways, popularly known as the "Cape to Cairo Railway." The title of this colossal project, worthy of a man who "thought in continents," is, however, a little misleading, and affords a striking example of the inherent snare which lies hidden under a catchy and *ad captandum* title. The man in the street, misled by the alliterative brevity of the popular name of this great trans-continental railway, is under the impression that the main object of the promoters of this line was to enable a traveller to "enter the railway carriage at Cairo and get out at Cape Town." It need hardly be said that it was not seriously intended to fling away millions by the establishment of an unnecessary *continuous* trunk railway from Cairo to Cape Town, when a convenient water highway could be utilised for a considerable portion of the route. A title, brief, popular, and alliterative, was, however, necessary, and none better perhaps meets these requirements than "Cape to Cairo," which appeals both to the imperialistic instincts latent in most Englishmen, and to the popular imagination.

The great national highways of commerce and traffic—the chain of Equatorial Lakes from Tanganyika to Lake Albert, running for the most part north and south, will be used to supplement the railroad. Then the Nile from Lake Albert to Khartoum will probably take the place of the railway, as it has done for years between Assouan and Wady Halfa. In fact, according to the latest scheme, some 4000 miles of the Cape to Cairo route will be by railway, and nearly 2000 by water.



From a photograph lent by the Rhodesian Railways Co.

THE GORGE BELOW THE VICTORIA FALLS

"Profile Point" in the foreground

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ROADMAKING IN THE GARDEN CITY

Over two miles of road have now been laid and sewered

THE MAKING OF A GARDEN CITY

PROGRESS OF THE GREAT EXPERIMENT AT HITCHIN—HOW THE LAND IS LEASED—THIRTY-FIVE MILES FROM LONDON IS TAKING PLACE THE MOST NOTABLE DEPARTURE IN TOWN BUILDING THE WORLD HAS EVER SEEN

BY

S. L. BASTIN

THE simple fact that a society has been formed for the propagation of some particular scheme is not, by any means, always a guarantee that practical work will result. Time and again the world has witnessed the birth of an association, founded with the object of furthering some good cause, and the whole outcome of the labours of a number of undoubtedly well-meaning people has never consisted in anything more than the issuing of an annual report and balance-sheet. Fortunately, this fate has not fallen to the lot of the Garden City Association, which had its commencement rather more than six years ago to give publicity to a scheme which promises to solve one of the most perplexing problems of the age. To-day there is a Garden City actually in the making. Month by month the work is steadily proceeding, and though, to the casual observer, the rate of progress may seem to be slow, yet as Mr. Rider Haggard humorously remarked at a recent meeting of the Association, "You cannot at once expect the New Jerusalem to settle down in Hertfordshire." It is not reasonable to suppose that a scheme for which there is no precedent should directly meet with the unqualified support of the public. Novelty in the business world is often, from the investor's point of view at any rate, only another word for uncertainty. But the high wall of prejudice is tottering, and it is safe to prophesy that the time may not be far distant when it will be considered a privilege to be a leaseholder in "First Garden City."

To appreciate the magnitude of the task with which the energetic Garden City makers are confronted, one must, as the writer did recently,

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THE RENT OF THIS COTTAGE IS 5*s.* 9*d.* PER WEEK

journey down to Hitchin, and, under the kindly guidance of Mr. H. Burr, the chief-in-charge at the surveyor's office, be conducted to the principal points of the estate. Standing on an elevation, somewhere near the centre of the town which is to be, the eye, except to the westward, could not reach beyond the boundary line. Miles of undulating country, in many places beautifully wooded, enclosing within its area several villages, three churches, and a number of fine old country mansions and farmsteads—such is the site on which it is proposed to develop on Garden City lines the most notable departure in town building the world has ever seen.

The visitor can hardly fail to be impressed by the suitability of the estate for the purpose. The district as it stands at the moment is very thinly populated, and indeed on the land which it is proposed to set aside for the town area, there are scarcely any houses at all: consequently there has been but little trouble in the way of disturbing existing tenants. In the case of the few small villages, situated in what will be the agricultural belt, the Company have generously decided to interfere as little as possible with the people already installed. Local opinion, which at first was very much opposed to the idea, is already beginning to turn in favour of the movement. The geological formation of the land is very largely made up of a layer of sandy gravel to the depth of about ten feet, underneath which there is solid chalk. In a few localities there is a certain amount of clay, but in no case is this sufficient to hamper the surface drainage seriously. The water-supply promises to be ample and of the best. From the agriculturist's point of view, the land is in a highly satisfactory condition; whilst many of the more sheltered positions would be admirably adapted for the cultivation of fruit-trees and general market-garden produce. The moderate elevation of the country, in no part of the town area more than 350 ft. above sea level, guarantees an atmosphere which shall be bracing without bleakness. Withal, the estate is barely thirty-five miles from London, and a branch of the Great Northern Railway passes through the very centre of the district.

Barely eight months ago, when the intricate business of purchasing 3800 acres was completed, a small cottage at Letchworth, about a mile and a half from Hitchin, was opened as an Estate Office by the Garden City Company. At that time of course nothing had been done towards the development of the tract of country. At the moment of writing over two miles of road have been laid and sewered; and more striking still, in two months' time quite forty houses will have been completed. It must

RAILWAY SIDINGS ARE BEING PROVIDED FOR THE COMING FACTORIES

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be borne in mind that all these erections are being put up by outside people, as the Company does not undertake the building of any dwelling-houses on its own account. Even at this dull season plots are letting briskly, and the demand for houses to rent is little short of amazing. During last summer, when there were hardly any houses finished, no fewer than two hundred applications from would-be tenants were presented at the local office. To understand what this really means, it must be remembered that, at the present time, the estate is, to say the least of it, somewhat awkwardly situated as regards postal conveniences, road communications, shops, water-supply, &c. If at the present juncture the demand both for the leasing of sites and for the renting of houses is so well maintained, how much greater will it not be when the various services are a little more in order ?

THE FOX INN, LET TO THE PEOPLE'S REFRESHMENT HOUSE ASSOCIATION

It must not be forgotten that the Garden City ideal consists in providing the inhabitants with all the conveniences of a modern town, as well as the healthful and beautiful attributes of the country. It is absolutely necessary that a great deal of the work in connection with the different services should be well in advance of the house building. Before many comers could be encouraged it was essential that the arrangements for the water-supply should be completed. This is now in an advanced stage, and the slow business of boring a hole to the depth of 220 ft. is nearly finished. The supply thus obtained will be pumped to a reservoir on the eastward side of the estate at an elevation of about 450 ft. By the time this article appears the work in connection with the gas-works will have been started, whilst a post office is on the point of being opened. The Great Northern Railway is well forward in its preparations for a "First Garden City" station, and indeed is only waiting for the Company to give the word to commence the erection of permanent buildings. The making of the railway sidings to adjoin the factories' sites is a work to which special attention is being directed at the present time. This is felt to be particularly desirable in order that firms may more fully realise the advantages which a site in "First Garden City" offers to them. The firms are coming, too; within the last few months four or five have definitely decided upon sites. A well-known house of printers and a prominent geyser manufacturer may be mentioned amongst others. It is confidently expected that many firms will be willing to erect houses for their own workpeople, and this will do much to forward the whole scheme.

We need not here enter into technical details, but it will be interesting to consider a few of the suggestions and instructions to intending builders in "First Garden City" which are offered by the Company. The land is leased on one of two terms—an ordinary lease for ninety-nine years, or a perpetual lease of 999 years, with a periodic revision of rent

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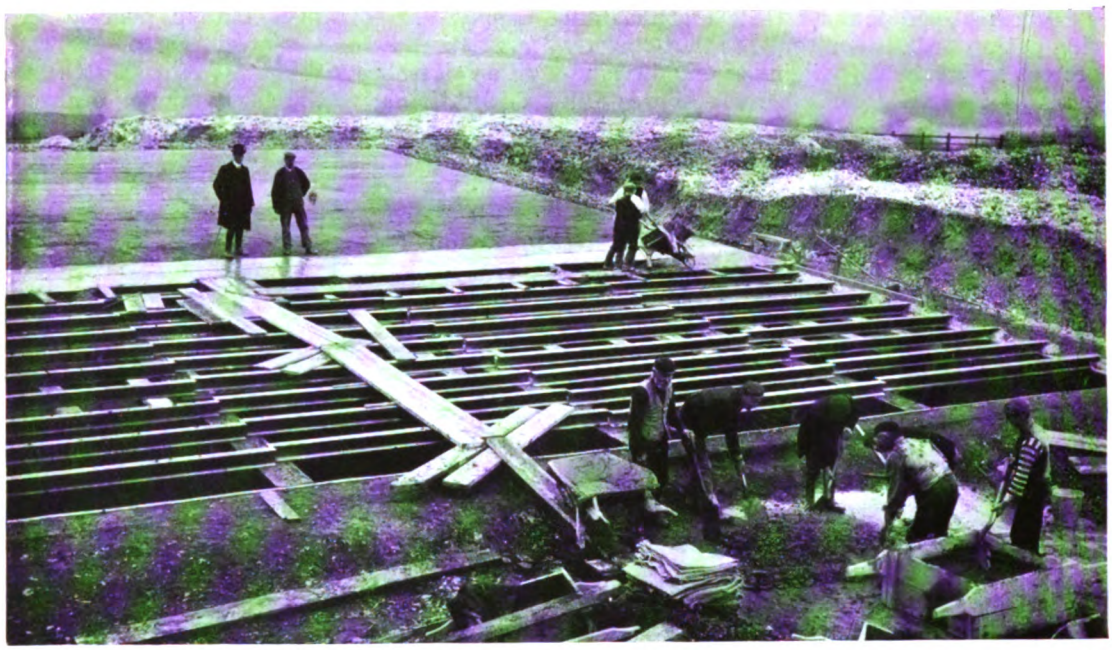

A PLENTIFUL SUPPLY OF WATER FOR THE NEW GARDEN CITY AT HITCHIN

Men at work on the reservoir. The estate is seen in the distance

considered apart from any buildings or tenants' improvements. Of course all plans for the proposed buildings must be submitted to the Company's appointed surveyor for approval. No encouragement at all will be given to "jerry builders," and the Directors prefer that one quality of material should be used throughout, for, in other words, that a house should be as good at the sides and back as it is at the front. One clause in the instructions builders would do well to take to heart. "It should be remembered that a sunny aspect for the main rooms is almost as important as ample air space, and that other considerations, such as fronting the house or cottages to the road, are of little importance in comparison."

The roadways at "First Garden City" are being laid out with great care and consideration. None of these will be less than forty-five feet wide, and the fine boulevard leading up to the centre of the town will have the spacious width of 150 ft. Every road will be planted with trees, and the Company are putting in quite a number of varieties, some of which are not at all commonly seen in our streets. In a road which has just been finished there are nothing but Acacias, and if one might make a suggestion it would be that a street planted with almond-trees would look very charming in the Spring; these trees are quick growing, and offer a nice shade when they are in leaf. After all, why not go a step further and plant fruit-trees in the roads?

It is proposed to screen the factories and the railway behind plantations of tall trees. Tenants will not be allowed to erect walls or fences except those of a temporary nature, as leaseholders will be required to plant hedges to mark off their property line. This method, it is felt, will add much to the pleasing aspect of the town as a whole.

Will life in "First Garden City" be pleasant and attractive? One would think that it ought to be. Not even the smallest house will be allowed less than a tenth of an acre (sixteen poles) of garden land. Open spaces and recreation grounds will be plentiful, whilst the wide agricultural belt completely surrounding the town area will always enable the city dwellers to be in close touch with the open country. It is believed that quite early in the existence of "First Garden City" rates will be abolished. This is not difficult to understand, when one remembers that the whole estate was purchased at the cheap rate of agricultural land, so that even the low ground rents required by the Company will, as soon as any amount of land is taken, swell into a magnificent return on the original outlay. As the dividend of the Company is strictly

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limited to 5 per cent., all profits over and above will be turned back for the benefit of the estate. Those employed in "First Garden City" will be able to live close to the scene of their labours; even in the agricultural belt a certain number of houses will be allowed, in order that the workers on the land may not have long distances to tramp to their work.

Whilst a very large portion of "First Garden City" will be devoted to houses which will appeal more directly to the labouring classes, yet the south-western part of the estate will be reserved exclusively for residential purposes. All the houses erected here will be required to be either detached or semi-detached, and of a respectable size. It may be mentioned that a capital golf ground adjoins this part of the city. All the manufactories being restricted to the eastward side of "First Garden City," the residential corner will be far removed from the possibility of any annoyance from smoke.

The question of the government of "First Garden City" is one which is under consideration. For the present the affairs are managed by the Company in co-operation with the local Council. Eventually it is suggested the Company should apply for District Council powers.

Much of the success of a scheme like the present depends upon those who are engaged in the carrying out of the practical side of the work. One cannot but be impressed by the enthusiasm with which, from the indefatigable secretary and manager Mr. Thomas Adams downwards, all those connected with the laying out of "First Garden City" are infused. Their spirit is one of great hope—that kind of hope which spurs on to untiring energy in any direction which will further the cause they have at heart. So confident of the future was one of the pioneer settlers in "First Garden City" that he erected a tool-house, potting-shed, fruit storage building—in all five places, before he had even the vestige of a garden!

The importance of the Garden City idea, even when regarded from a purely abstract point of view, can scarcely be overestimated.

People who are familiar with the town of Oldham, in Lancashire, will appreciate the full weight of the fact that an association has been recently formed, called "Beautiful Oldham Society" with the object of seeing what can be done towards improving the town. If the most hopelessly depressing collection of houses and factories in England can take heart of grace, there must surely be hope for all.

It is interesting and instructive to consider the manner in which existing cities and towns might be brought within a reasonable distance of the Garden City ideal. There are many English towns which have increased extensively during the last few years, stretching out far into the surrounding country. What immeasurable benefit might not we be bestowing, not only on ourselves, but on future generations, if we could empower the borough councils to call a halt, and enable them to order that the extension of the town should only be carried on after the leaving of a belt of open country. Perhaps this is too much to hope for, just at present; but there is no saying what might happen once a Garden City is actually in existence and proving itself a success before the world.

THE ARCHITECT'S HOUSE, IN LETCHWORTH LANE

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SATURDAY AFTERNOON AT THE LABOUR COLONY NEAR LAINDON, IN ESSEX

LONDON'S "UNEMPLOYED" AT WORK

HOW LONDON IS MEETING THE DISTRESS THIS WINTER—THE LOCAL GOVERNMENT BOARD AND THE GUARDIANS—HELP FROM MR. FELS OF PHILADELPHIA AND LONDON—THE LAINDON LABOUR COLONY, AND HOW THE POPLAR GUARDIANS ARE WORKING IT FOR THE GOOD OF THE MEN

BY

TOYE VISE

WORK for the workless: that is the clamant cry that year after year during the winter months has been heard in London; and at last it would seem that the opportunity will not again be missed of stretching out strong helping hands in the day of need.

In October last the Rt. Hon. W. H. Long, M.P., President of the Local Government Board, outlined a scheme, at a conference of Metropolitan Guardians, for dealing in an adequate fashion with the unemployed. The result has been the forming of Distress Committees in each of the Metropolitan Boroughs; and from these bodies a Central Committee has been formed, on which the London County Council is represented by Mr. Benn, M.P., and Mr. Alliston. Summarised very briefly, the work of a Distress Committee may be put as follows:

(1) Registering applications for work.

(2) Division of applicants into two classes; (*a*) The temporarily distressed; (*b*) Incapables.

(3) To urge the Borough Council to put all possible work in hand.

(4) To act as agent between applicants and employers living in the borough.

(5) To report to the Central Committee inability to find work in the immediate district.

The business of the Central Committee will be "to act as advisers . . . and as controllers for the whole of London, so as to secure as far as possible a common policy throughout the Metropolis." In the event of the distress becoming very acute, this Committee may possibly put in hand works of an extensive character, but on this point Mr. Long is rather indefinite. It is proposed that all funds shall be vested in it, whether raised by private subscription or from a uniform emergency rate covering all the boroughs.

Through Mr. Long a free offer has been made

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to the Central Committee by an American gentleman (of whom more anon) of 1200 acres of farm land within a reasonable distance of London, the same to be used as a labour colony for the unemployed; and the Central Committee have accepted the proposal. Again, the Salvation Army has announced to Mr. Long its willingness to receive immediately at Hadleigh four hundred married men at a weekly wage of 15s., and another six hundred as soon as the necessary sleeping accommodation can be erected. The Church Army, at the head of which is the Rev. Wilson Carlile, has already opened special labour yards in different parts of the Metropolis for destitute married men. After doing two hours' wood-chopping in these yards a man is provided with food, and given a bed ticket for a common lodging-house. All unmarried men may apply for work at the various labour homes of the Church Army, having entered which they are compelled to stay for several weeks at least.

Mr. Long's scheme has yet to prove its utility; but the labour farm connected with the Poplar Workhouse has become an important factor in solving the question of how to regenerate the able-bodied paupers whose lives are one long waste of time. It is the first of its kind to be established in England. As far back as 1894 the Poplar Guardians urged upon the Local Government Board the pressing necessity of providing land on which the able-bodied inmates might be set to work, not only to the great moral and physical benefit of the men themselves, but also eventually to the partial alleviation of the heavy burden borne by the ratepayers. For this purpose it was proposed to purchase a farm of two hundred acres, but after a protracted correspondence the matter fell through, as the Local Government Board were of opinion that in the present state of the law the land could be purchased only as a site for a new workhouse. For nine years the scheme lay in the grave thus dug for it by the Local Government Board. Then during the distress of 1903 came a partial resurrection. An arrangement was entered into with the governor of the Salvation Army Labour Colony at Hadleigh whereby a certain number of the able-bodied inmates (the Guardians strongly object to the word "pauper," and have obliterated it from their official vocabulary) should be

MOST OF THE COLONISTS WORK WITH A WILL DURING THEIR EIGHT-HOUR DAY

The former workhouse-inmates are here seen at work constructing a reservoir. Having plenty of good food and hard regular work they enjoy excellent health. No money payment is made to the men; the idea is intended to fit them to be agricultural labourers either in England or the Colonies

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transferred to his charge on the payment by the Guardians of a weekly sum of 10*s.* 6*d.* per head. Altogether some fifty-six men were sent to the colony, and of these thirty-two left without notice, eleven remained chargeable to the Guardians, and eighteen became partially self-supporting. The experiment was emphatically no great success! Meanwhile the Poplar people again approached the Local Government Board, "to consider the desirability of establishing a country workhouse where farm work could be undertaken."

For many weeks the battledore and shuttlecock of official correspondence went on merrily enough; pigeon-holes grew full, and miles of red tape made a brave show. But in every letter ran the refrain: "What about the money?" Having put their fat forefingers under the so stubbly chins of the unemployed, the authorities drew back alarmed at the prospect of shaving so many of them into respectability! While the authorities were thus dilly-dallying, a business-like letter was received from Mr. Joseph Fels, an American gentleman living in London, who offered to provide, free of charge, the necessary land on which the experiment could be made. The conditions of the offer were that the Guardians should have the use of a hundred-acre farm for a peppercorn rent for three years, with the option of purchase either before or on the completion of that period. In an interview that Mr. Fels had with the Guardians he stated that he had had considerable experience in dealing with the unemployed when in the United States, and that in the Quaker City of Philadelphia somewhat similar experiments to the one under consideration had turned out most satisfactorily. Sanction having been obtained from the Local Government Board, the offer was eventually accepted with many thanks. Upon this Mr. Fels immediately proceeded to make good his word by purchasing a hundred-acre farm at Dunton, near Laindon, in Essex. The price paid was £2125, and the Guardians took formal possession in March last.

The site of Sumpner's Farm—the name of the estate acquired—is some three miles from the nearest village; and this distance from the fringe of the world was purposely taken into consideration by the purchaser, so that the workers, who were to be allowed a certain amount of liberty, might not be tempted by the proximity of a cosy bar parlour. Included in the price of the land was an old farmhouse, and some tree-shaded, thatched and red-tiled outbuildings.

As the housing accommodation was entirely inadequate for the colony of a hundred men it was proposed to establish, the Guardians secured two second-hand corrugated iron buildings, and these, with the erection and repair of other necessary structures, cost £1759. One of the corrugated iron sheds has been converted into a bare-looking but comfortable enough dining-hall, and the other is used as a dormitory. Unlike so many Poor Law institutions, the number of officers in charge of the colony is very small, there being but four—namely, the superintendent, who is a most capable North countryman, the assistant superintendent, the matron (wife of the superintendent) and a male cook. And with regard to the department of the latter even a lady Guardian could hardly find it at fault, as everything is run on most liberal lines. For breakfast—with the exception of Sunday, when eggs are provided—meat is always served, consisting either of cold pork, corned beef, cold bacon or German sausage. Beef, mutton and pork, bread, vegetables, and a variety of puddings, make up the dinner menus; and the last meal of the day is a good substantial tea, in which the German sausage again figures, to make no mention of corned beef, marmalade, jam and cake.

That this particularly good fare is thoroughly appreciated by men who have been accustomed to workhouse diet, need not be said, and after all it is well deserved, for most of the colonists work with a will and keep hard at it during their eight-hour day. And it is probable that to the quantity and quality of the food and the hard regular work may be attributed the excellent health enjoyed by the little community. At the beginning of November one man only was on the sick list, and he was suffering from a heart affection. When in the Poplar Workhouse numbers of these converted labourers were frequently unwell. Keep men mewed up in idleness or employ them at stupid tasks, and the doctor will always be busy, and more than earn the niggardly sum doled out to him by grudging Guardians.

Almost the first piece of work that the men were given to do was the constructing of a reservoir, and on this job a number of them are still employed. This reservoir is very necessary to the well-being of the colony, as all the water now required has to be brought in carts from the South Essex Water Co. at East Horndon, a matter of some two to three miles. When finished, the reservoir will hold about 200,000 gallons of water, which will be collected from

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a rivulet that now runs to waste through the estate. The construction involves the damming of the stream with a concrete wall, and the widening and deepening of the waterway. Except for one paid bricklayer, all the work is being carried out by the colonists, working under the orders of the superintendent.

Most of the colonists have been and still are engaged in purely agricultural work, and 50 per cent. of the men are declared to be almost on a par with the ordinary farm hand. As the soil is of a hard clayey nature it is somewhat difficult of tillage—to put it mildly. Nevertheless, the work has proceeded apace, and the men are honestly proud of the transformation they are effecting. To make any farm pay in three months is impossible, and up to the present the colony has been run at a loss, but the Guardians consider there are indications of a fair profit being made in the future. But the chief cause for congratulation is the benefit that has accrued to the workers. The men are no longer pauper-stricken creatures, and they look forward to the time when they shall become fit to leave the colony and take their share in the work of the world as agricultural labourers, either in England or the Colonies, which is the very object that the Guardians have in mind.

It is not within the power of the Board to make a money payment for work, but everything is done to make the life as pleasant as may be in the circumstances. From two o'clock on Saturday afternoons the men are practically free to do as they will, and some manage to earn a little by undertaking small jobs in the neighbourhood; others play football; and in the evenings throughout the week indoor games are permitted until 8 o'clock, at which hour the colony retires to rest, or at 10 P.M. during the spring and summer months. And last, but not least, each colonist has a weekly allowance of something more grateful and comforting than cocoa—an ounce and a half of good shag.

Mr. Fels' generous action in providing this experimental farm has had a far-reaching effect. The apparent success of the scheme encouraged him to make that offer of 1200 acres, reference to which was made in the early part of this article; and at the present time he is in communication with six Boards of Guardians in the midland and northern Counties with the same end in view.

THE COLONISTS RETIRE TO REST AT EIGHT O'CLOCK

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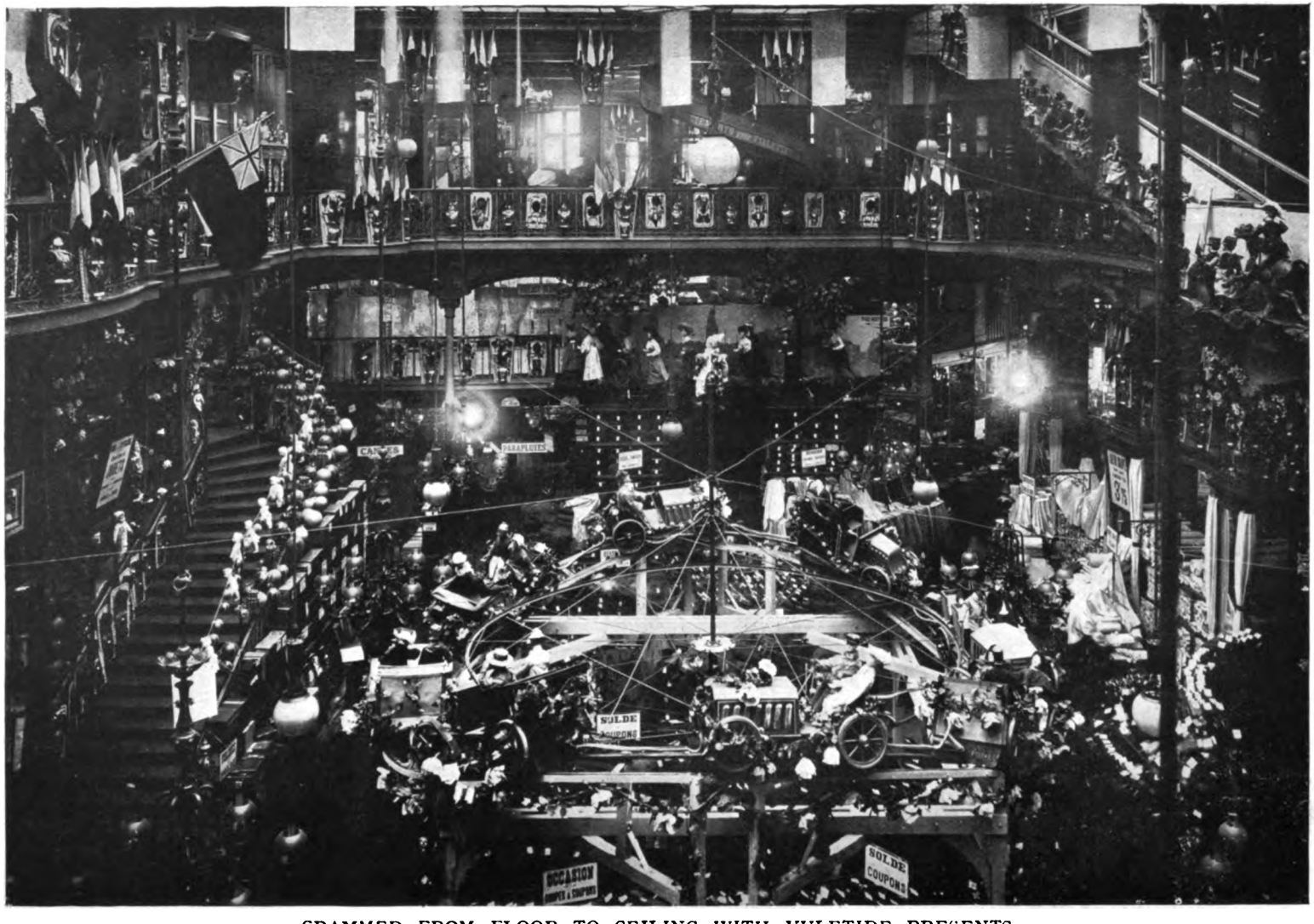

CRAMMED FROM FLOOR TO CEILING WITH YULETIDE PRESENTS

The Christmas Show at a great Paris Shop- "The Louvre"

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A COMICAL FELLOW IS ENGAGED TONSORIALLY UPON HIS BROTHER COMEDIAN

A scene from the Children's Fair at the Bon Marché

PARIS SHOPS AT CHRISTMASTIDE

THE CHILDREN'S DREAMLAND—JOYS OF CHRISTMAS IN THE CITY OF LIGHT —A VISIT TO SOME OF THE GREAT STORES — NICETIES OF ORGANISATION — A CONTRAST WITH LONDON: THE PREDOMINANCE OF MEN IN THE SHOPS— SHOPPING ON CREDIT AND SHOPPING BY POST

BY

A PARISIAN

NEVER does the *ville lumière*—save on a successful Fourteenth of July—merit its fascinating title more than on Christmas Eve. The Boulevards are turned for the nonce into an open-air fair, a miniature Nijni Novgorod with each side lined with wooden huts, stretching from the Madeleine to the Place de la République. Within the booths are gathered all imaginable articles representing the art and ingenuity of the French. It is dreamland for the children—dreamland peopled with a fairy population of dainty dolls, flaxen-haired with a fixed and ineffable smile, of tiny tin soldiers ready to defend "la Patrie" at the point of their tin bayonets, of droll little figures dressed in strange costumes able to contort themselves in the most surprising way, of bears and leopards and sheep and geese, of pigs and elephants; indeed of every kind of beast and creeping thing known and unknown to Father Noah. Long-haired Paderewskis play at mechanical pianos, jet-black niggers

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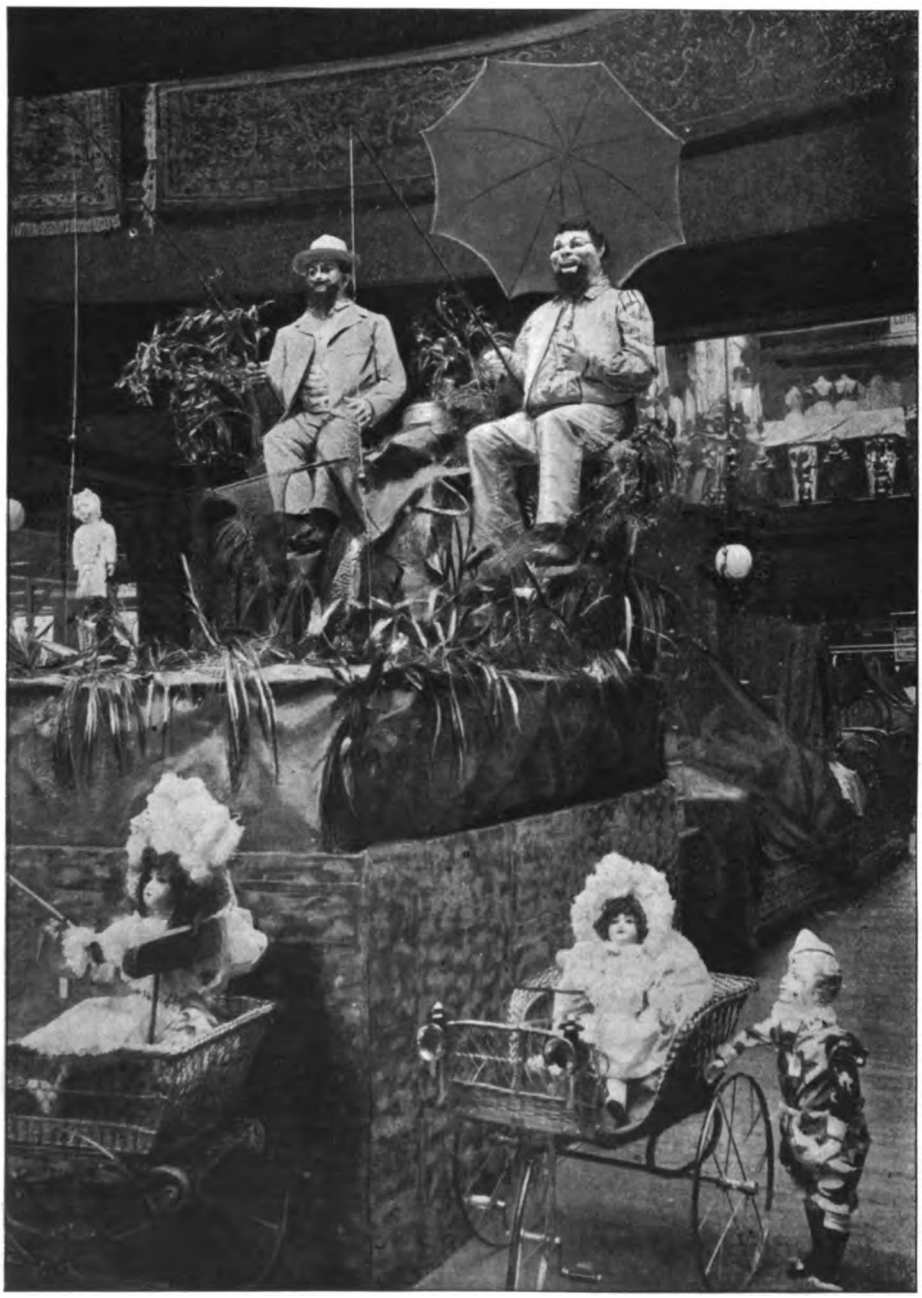
oscillate a nimble hand across the strings of a banjo, Jacks in the box rise suddenly from their hiding place to say "Bon jour" to little friends, "chic messieurs" make a polite bow to you in the best Parisian style—has not even an Oriental visitor deigned to take lessons from them in the art of salutation? And as politics play so large a part in the daily concerns of the Parisian that they cannot be excluded from the nursery, you will find a topical doll or a topical group illustrative of the Far Eastern war, with Russ and Jap locked in an embrace which is not meant to be loving; or a fierce-looking gendarme will be escorting a particularly mild-looking Sister—a reference which requires no explanation. What with the ironclads and torpedoes, racing automobiles and dirigible balloons, it would be easy to reconstruct the history of the hour from a promenade through toyland.



UPON A ROCK ARE TWO NIGGERS, FISHING

A corner of the show at the Bon Marché, whose ready-money business is said to be the largest in the world

Nor is the appeal solely to the child. At yonder stall they are printing "bristols," as small visiting cards are called, by the thousand against New Year's Day, when custom decrees that a self-respecting man shall scatter these bits of pasteboard with an inscription of good wishes to all and sundry of his friends, and even business acquaintances. And let him fail not at his peril in observing the convention. Many a legacy has gone astray because of

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it. Also you may buy trifles and souvenirs for female friends; embroidered handkerchiefs with the dear initial worked in the corner, gloves and fans and objects for the toilet table. Books there are in plenty, and sometimes a *trouvaille* in first editions or rare engravings.

The market of the Boulevard secures the highest patronage. On Christmas morning the President, accompanied by members of his household, walks down its length, making purchases here and there, with thought for some sick child in one of the great hospitals, and speaking friendly words to the curtseying stall-keepers. These yearly visits were the delight of Felix Faure, who, as all the world knows, was not insensible to popular applause. A fine figure of a man he looked on these occasions, the popular ruler of a great people.

Everywhere are signs of Christmas rejoicing. The *cafés* and the restaurants present the gayest of scenes. Champagne and oysters, and champagne and turkey are the traditional fare, save for the people whose purses will not run to such extravagance. For them is the *boudin*,a somewhat fearsome compound of the parts of a pig—a black pudding in fact—washed down with as good a white wine as the *marchand de vin* can be tempted to produce. The supreme moment is at midnight, when glasses are solemnly clinked and each man wishes his neighbour the best that the gods can give him. In the greater restaurants, such as in the Café de Paris, the *coup d'œil* is particularly brilliant. From out the crackers have proceeded fantastic caps in paper, and wondrous trinkets with which the ladies decorate their hair. At every mouth, even of the most austere, are strange instruments which give forth a joyous, if somewhat discordant sound. But it is Christmas Eve and every one is licensed to make his own music even if he know no note of it. Thus, in this riot of sound and babel of tongues (for the stranger within the gate is foremost in the gaiety), in the clinking of glasses, and the pop of champagne, is the period of peace and goodwill ushered in upon the Parisian. Elsewhere the fun may be wilder and less decorous; but sufficient unto the day are the ordinary and rational forms of enjoyment. In places where they sing, carols are heard, notably at the church of St. Eustache (the most remarkable in Paris, and situated in the quarter of the Halles), sweetly sung by members of the Opera. Persons are present at this solemn festival who are never seen in church at any other time.

In the great shops of the metropolis is the greatest spectacle of all. They are crammed from floor to ceiling with presents for Christmas and New Year. Let us pass through the swing doors of one of the great Paris stores, the Louvre (hardly less famous than the splendid museum of art whence it gets its name), and see for ourselves. In the centre of this lofty building is a vast Christmas tree towering to the roof. Gold and silver balls hang from every branch, and shimmery things that catch the wayward lights, like the sparkle of a magic hoar-frost Beneath the branches are a myriad dolls—baby dolls, grown-up dolls, soldier dolls, and dear delicious *poupées* that belong to no special category save that they are destined, each and all, to warm the heart of some child-mother. No wonder little Blanche tugs at her Mamma's sleeve and whispers: "Dis, Maman, will the Bonhomme Noël bring me a *poupée* like that?" —fixing a rapturous gaze upon a pink-and-white maiden with real boots and clothes that take off. "Oui, mon ange, si tu es bien sage," says the mother, and you may be sure that her infant daughter does not neglect to place her tiny shoes on the hearth on Christmas Eve so that Monsieur le Noël is bound to see them when he descends the chimney carrying presents for all good children. This yearly visit of Father Christmas (it is the Christ child in pious families) is the sweet belief of every child in France, just as St. Nicholas or Santa Claus is the good genius of the Anglo-Saxon. Happy childhood whose faith brings presents instead of Christmas bills!

Where London Leads

The great Paris shops have a closer resemblance to the Brobdingnagian stores of New York than the "universal providers" of the London pattern, where there is a certain segregation as if one department did not quite belong to another. London, however, leads the way in its respect for the inward man; it offers a free lunch to the customer. Paris has stopped short at the afternoon *goûter* of cakes and wine. In the beginning the shopper of either sex was invited, but experience showed a chronic disposition on the part of the men to take advantage of it. So now it is only women and children who are bidden to the feast.

The basement of the "Louvre" is not devoid of interest. Every particle of space fulfils a duty to the store above. For instance, there is a detachment of firemen, thirty strong, ever on the watch against an outbreak amongst the valuable stuffs stored above and below ground. There are also the dynamos for

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generating electricity; a blacksmith's forge and carpenter's shop where they make and repair the day through for the up-keep of the establishment; a gas-engine harnessed to a lift for merchandise (ascending and descending like Perpetual Motion or the prisoner's treadmill), gasps unceasingly; another piece of mechanism cleans for ever the carpets on each floor on the principle of the vacuum pump. Would you be surprised to hear that there is a staff numbering three thousand five hundred? Unlike the English shops of the same class, the male help largely predominates, even in the departments that have purely to do with fashions. There is an idea that man is more suited for an occupation that at best is arduous, and requires endless physical exertion in the carrying and return of goods. The staff is for certain purposes brigaded like the vehicles. One hundred and fifty young men sleep in the stores each evening and form the company of the watch. In case of fire or an attempt to break through and steal, the young men are on the spot to render aid. Nor is this all. A certain proportion of *inspecteurs*—those immaculate personages in white cravat and black frock-coat one sees on duty in the daytime at the doors—are told off, each night, to watch and ward over the treasures of the emporium. The belated pedestrian may observe these men, dressed for the nonce in plain street clothes, walking quietly in the immediate vicinity of the building, casting, every now and then, an upward glance at the tall fabric to assure themselves that all is well.

Behind the Scenes in a Great Emporium

It was the day of small things when, exactly fifty years ago, two simple shopmen, Alfred Chauchard and Auguste Heriot, went into partnership on borrowed capital. It was the moment of the first French Exposition, and the third Napoleon was transforming Paris into the city beautiful. The capital of the house is now held by three persons: M. Chauchard, Mme. Heriot, and another. A short time ago it was said that Colonel Marchand was about to marry Mme. Heriot—herself a simple employee in the shop before she met Commandant Heriot, the brother of the founder—but the marriage will not take place. It would have been an immensely rich one for the "hero of Fashoda," the lady having in her own right, as guardian of her children, a fortune of something like three millions sterling. The command of such wealth would have placed Marchand at the head of a formidable political movement—the usual lot of the popular soldier in France—but there were considered to be reasons against the union, and they have prevailed.

A Yearly Turnover of £7,200,000

On the other side of the river, in the Rue du Bac and adjacent streets, is the well-known Bon Marché. It is the establishment that is said to do the largest retail ready-money business in the world. The yearly cash turnover is something like £7,200,000. Amidst its graver preoccupations, it has not forgotten that it is Christmas. In the centre of the larger establishment—for there are two: a main building and an annexe—is a Children's Fair. Shall we peep in when no one is about and see how its inhabitants do? We are in Liliputia, and we must obey the laws else like Gulliver we may find ourselves captured by a sharp little foe, making up in intelligence and gallantry what it lacks in individual size. Draw near, softly, and you will hear Mr. Pig and Mrs. Pig playing a duet on the piano, and little Miss Pig dancing a jig on the top of the instrument. Very dainty she looks all in white, with her fan coquettishly held, and her dress just slightly raised so that the flounces of the under skirt are seen. She was just preparing to sing when a mischievous clown, who had really no business there at all, inserted a fishing line in her mouth. It was most annoying, and Father Pig took the joke so ill that he is like enough to send the humorous young man a challenge to a duel. From another corner comes the clatter of wooden horses on the floor, and every now and then we hear snatches of conversation delivered in the high treble that is the favourite speaking voice in doll life. A clown from the Nouveau Cirque, mounted on a splendid rocking horse, is galloping round the corner to meet his friend from the Cirque d'Hiver. Meanwhile, the little *danseuse*, with a tambourine is kicking vigorously, though no human hand has wound her up. A soldier hard by, dressed as in Empire days, seems to find it rather dull work, but there is no lack of amusement up on the platform, where a comical fellow with a nose like M. Coquelin's when he plays Cyrano de Bergerac, is engaged tonsorially upon his brother comedian, a beautiful fellow in striped clothes, and a smile that will not wash out. Upon a rock are two niggers fishing, while in the valley below, pretty little Mademoiselle is going for a morning drive—an independent Miss surely, with no fear of being run away with. But space is

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utterly inadequate to deal with half the treasures of this delightful playing ground. Supposing we take train upon an elevated track established in another corner, we shall be carried swiftly along past mountain scenery with palms jutting from the lower slopes and a castle crowning the brow. Down below, the architecture changes to an Oriental pagoda. A lively mob of Pierrots chaff and chatter, and the policemen, poised here and there in the floating throng of merry-makers, seem powerless, even if they had the will, to stay the flow of wild exhilaration. Let us peep a moment down the children's avenue, after pausing to look at the hot chestnut men, a sign indeed that Christmas is with us ("Winter's swallows," is the Parisian's pretty name for them). What an Eldorado it is, this avenue bordered with tall hedges, blooming with Christmas fruit. No wonder *le petit* Dupont gasps with delight when, later in the day, he is conducted thither by his fond mother. There are military toys and scientific toys, sporting toys, toys that have an educational bias, toys that amuse and nothing more. Well, it is all very fascinating and wonderful, and you may be sure that young Paris will spend no common Christmas, this year. But let us proceed to the maturer joys of the Bon Marché.

Light in Relation to Ladies' Dress

Downstairs are the departments for the current coin of shopping; upstairs, you have the bank reserves—fine dresses and all manner of *recherché* things. These collections of Christmas lamps, for instance, with their pink, their blue, and their green shades, are as pleasant a picture as one could find, telling of a quiet and refined domesticity. And the dresses give one an excellent idea how exacting the French middle-class dame has become in the matter of wearing apparel. These creations in Irish lace and silken lawn are the apparel of a duchess. If you wish to learn a secret or two, you penetrate to the upper regions where the *ateliers* are, and you see how strong, successful, commercial Bon Marché contrives to turn out *chic* dresses at a figure that is certainly below the Rue de la Paix. The secret is organisation.

A great feature are the *salons d'essai*. The largest room of all is strongly illuminated with five groups of electric lights behind reflectors. Supposing a lady is attending a function at the Elysée, she can at once see the effect that her robe would have under a brilliant illumination. If, on the contrary, she is dining with friends whose salon has a subdued light, she can again judge of the effect upon her toilette by a disposition of the lights in the *salon d'essai*. The variation of colours under strong artificial light is well-known, of course, to dressmakers. Blue is apt to look greenish; cream becomes white, and white inclined to greyness. Certain colours do not move, such as buttercup, but other tones of yellow become brighter or duller as the case may be.

A little experiment was carried out before me which showed how important the study of light is in relation to dress. A texture of a delicate lilac was brought in. Under the electric light and seen at the further end of the room it became pink; brought nearer to the observer, it showed a "bad" colour—something mixed and indefinable. Shall we be very "indiscreet" if we picture the case of a woman whose gown has to serve a double purpose; a wedding in the church and a reception in the evening? Naturally for the first ceremony she has to buy a bolero and a hat with a feather: both articles must match the dress. In the evening the same robe becomes *décolleté*—we hope our information is received in the spirit in which it is offered. The salon, therefore, *pour le choix des couleurs de robes de bal*, becomes a necessity.

Politeness in the French Store

Many people imagine that the Bon Marché is run on co-operative principles, that is to say that the employees have a share in the profits. That, however, is not correct. Every one is directly interested in the success of the business, but it is not in the ordinary sense of the word co-operation. The salesman receives a commission of 1 or 2 per cent. on each sale which he effects, and the departmental managers and clerical staff receive a certain bonus calculated in various ways. Perhaps the idea arose from the circumstance that the staff of the Bon Marché are exceptionally polite, even for a French store, where courtesy is the commonest commodity. The founder of the Bon Marché, M. Aristide Boucicaut, was one of the first Frenchmen to realise the whole duty of the employer to the employed. One of the sights of the Bon Marché is the dining-room, seating a thousand, where the employees daily eat their lunch and dinner. The kitchens, too, with their army of cooks and giant coppers for the boiling of soup and vegetables, are an interesting illustration of the commissariat side of a great house.

In the poorer quarters are shops making

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special appeal to the working classes. Some of them have high-sounding names such as: "Au Soldat Laborieux," "Aux Travailleurs," "A la Patrie de la France." The most important of all is the well-known "Aux Classes Laborieuses," which in a spirit of unusual modesty declined to talk about itself for the purposes of this article. Most of these establishments exist largely on the credit system: that is to say, a large part of their business is done by coupons and not in ready money. The originator of this idea is M. Dufayel, probably the most enterprising, as well as the wealthiest tradesman in Paris. He instituted *bons* of varying amount up to £20, wherewith the person who is supposed to be good for that sum can obtain credit. It is a system, of course, demanding a great deal of organisation, and not a little risk of bad debts. Credit is generally established on the report of the *concierge*, who is the keeper of everybody's secrets in Paris. The rates of payment and the denomination of the bond depend on the earning capacity of the husband. In a general sense the system is not to be commended.

Tempting the Housewife

It tempts the housewife to overstep the limits of expenditure by the very ease of it. On the other hand, it has distinct conveniences. One is that the *bon* is interchangeable, and is accepted in a large number of shops. Thus the purchaser can move from store to store until the credit is exhausted. The issuer of the coupons recoups himself, not out of the purchaser, who gets good value for his money, but out of the purveyors, from whom he takes a commission of 12 per cent. Naturally the tradesman would prefer a business that brought him a full return for his money, but he is glad, nevertheless, to receive the coupons, on the principle of the half-loaf being better than no bread. Coupon day is a wonderful sight at the great popular stores. Women in their thousands crowd the shops, laying siege to special counters or flying hither and thither in an effort to overtake the bargain—that feminine Will-o'-the-Wisp that may lead them into the quagmire.

No nation is kinder-hearted or really more domesticated than the French and it is a pretty as well as a pathetic sight to see the enthusiasm which mothers and fathers of the poorer classes display in the purchase of toys for their children. it is the scene of the greater world repeated on a reduced scale. The poor do not buy rocking-horses, and mechanical toys and elaborate dolls that say "Maman" when you touch the spot. But the rag *poupée* is destined to be loved just as well by its little owner—better, I dare say, for the children of the rich are apt to weary quickly of their pets. It is in sous instead of francs, this present-buying of the poor, but Mme. Chose, whose husband is a porter in the Halles, steps just as blithely into the store of "the Honest Artisan" as does the dame of the *bourgeoisie*, with full purse of gold, into the Louvre and Bon Marché. In either case the office is equally blessed.

But amongst the working classes, Christmas as a time of presents and good cheer is overshadowed by the *Jour de l'An* (or New Year's Day). Obviously in their calendar there cannot be two observances. They choose the one that seems to them to mark the seasons and moreover is associated with a long tradition. Christmas has its pleasures and its feastings, its joyous *réveillon;* but New Year's Day is more thoroughly the day when there is a pause in the round of daily toil.

Shopping by credit has been noted as a fixed institution with the French working classes, but shopping by post is also worthy of remark, if only for its great convenience. The delivery of parcels is not directly undertaken by the post office, but is entrusted to the railway company. By an arrangement made through the post, however, the carman delivering the parcel receives the money from the consignee. This money stands to the credit of the sender at his local post office, where he may draw it subject to a slight deduction for the accommodation. If the parcel is light in weight and bulk, so that it can be delivered in letter form, then it is the postman who "touches," as the French phrase is, for the amount. It is a very simple and convenient arrangement. This shopping by post, however, has its limit, and applies only to goods of an ordinary kind. The post office refuses to bind itself for sums of great amount. Valuable pieces of jewellery, for instance, are generally dealt with directly by an emissary of the diamond merchant. But for, say, a lady of Lyons who wishes to clothe herself in Paris fashions without the trouble of a visit to the capital, there can be no better method. In all the stores the niceties of organisation are carried very far, and most clients have their number whereby they are known, and whereby they shop through the medium of the post.

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ART AND BUSINESS IN THE MUSIC-HALL

ARTISTS ON THE WING—"THE ONE LIVE CONCERN"—THE TAKINGS OF SEVEN LONDON HALLS IN A YEAR ARE HALF A MILLION STERLING, AND THEIR EXPENDITURE THREE HUNDRED AND EIGHTY THOUSAND—A PAYING BUSINESS—DAN LENO'S EARNINGS—THE VALUE OF A COMIC SONG—A POUND A MINUTE FOR PARTICULAR STARS

BY

TIGHE HOPKINS

FOR some hours of an evening the comedian of the halls lives at high pressure. Not without cost to himself does he set London in a roar. His labour begins at about the hour when City drudges are going home to supper, and midnight may be drawing on ere he puts in his last "turn." He has perhaps in the meantime dodged half over London in his brougham, and changed wig and paint and costume half a dozen times. But he earns at this arduous little game from £1000 to £10,000 per annum. The town is always willing to pay for its laugh, and poor little Leno might have left a fortune.

Behind the scenes there is one particular difference between the music-hall and the theatre. The music-hall has no green-room. Your comic, your juggler, your looper of the loop, your beauty in tights or dancing-skirt, is solely on business bent. There is perhaps a minute's chat at the wings as one performer quits the stage and another is waiting to take it; but the green-room, which may be so charming a feature of the theatre, would be quite out of place at the music-hall, where no one would ever have time to enter it. And the dressing-rooms? We know (from pictures, at any rate) the Liberty boudoir of the leading lady in any West-end theatre. You will find no such apartment as this behind the stage of the music-hall—albeit the music-hall dressing-rooms are both numerous and excellent. Actor and actress spend their nights in the theatre; it is their second home: the artist of the halls comes, flashes his little "turn" upon the stage of the Palace or the Oxford, and is off to some other house a couple of miles away. There is no social life behind the scenes of the music-hall; its artists are on the wing throughout the night.

Sharp is the word. A basket of clothes, snatched by a dresser from the roof of a brougham, goes flying through the stage-door. After the basket whisks an entertainer of either sex, valued by the management at from ten to two hundred pounds a week, who has just a few minutes for dressing and making-up. No time to reach a dressing-room? It doesn't matter. Fix up a couple of screens at the wings; the gentleman will dress in there. The stage-manager hovers with one eye on the improvised dressing-room and the other on his watch; turn No. 7 is nearly over. No need, however, for anxiety; No. 8, wondrously transmuted, emerges in the nick of time; the audience has not waited for a moment. In a twinkling he is back for another lightning change; and in twenty minutes or so the basket is whirled again through the stage-door and the brougham is once more upon the trot. At this cyclonic rate does the genius of the halls make his fortune, and cover London breathlessly in a night. But the right kind of temperament is indispensable; and lacking this poor Dan Leno slipped into an early grave, the tragical comedian of his day.

In the great business of keeping London pleased with itself, the one live concern is the music-hall. Novelty of any sort is rare in the theatre; the music-hall, on the other hand, knows nothing of marking time. The Euston, one of the many establishments under the very capable direction of Mr. Adney Payne, gives two performances nightly, and a complete change of programme every week.

How many music-halls does London contain? I don't know. As far back as 1892, the Select Committee on Theatres and Places of Entertainment spoke of metropolitan music-halls "of various kinds, numbering 189." In

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thirteen years that number can scarcely have diminished, for I find that the suburban music-hall is now as conspicuous as the suburban theatre, and that in the whole vast area of London no district is unprovided. North, south, east and west, every week-night of the year, an army of clever people is going to and fro, administering to our gaiety.

It is an eminently paying business, too. The modern theatre of varieties, a growth of the last twenty or five-and-twenty years, ranks among the most lucrative industries of London. Capital amounting to many millions is risked in it. One syndicate alone, that of which Mr. Adney Payne is the chief representative, has a share capital of over a million sterling. Directly and indirectly, this industry of the halls gives employment to many thousands of persons; while, as for dividends to share-holders, 20 per cent. is not unheard of, and 10 per cent. is perhaps a fair average.

There are very thriving music-halls in the larger provincial towns, but you must come to London to see these places at their best. Paris has nothing to compare with them. What need to say that London at all times can provide the finest of everything—an Indian curry or a Spanish dancing girl? To London, sooner or later, every one will come to enjoy it; and London is consequently always more or less full of people who, as soon as they have been fed, demand to be amused. Those who provide the puppets are not dependent upon a settled native population. As every cracksman of note (so they say) at some time in his career seeks plunder in London, so does the whole world of pleasure-hunters filter through it. The provinces send up their thousands and tens of thousands; Europe and America send theirs. The later the dinner-hour the more likely are the diners to look for a show where their entrance disturbs nobody, and they are not at the trouble of guessing the plot of a half-sped drama. The music-hall is the great free-and-easy. It caters alike for the gallery which wants a real long night out, and for the stalls which sometimes ask no more than half an hour's diversion. You come and go as you please. You sit or stroll about as the mood takes you. Your coffee and liqueur are decent, and no one hinders you from smoking. Pay your money, be good, and this is liberty hall.

I remember the music-halls of the eighties, the direct descendants of the old tavern "sing-song." I am pretty certain no lady was ever seen in any licensed casino of those days—I am *quite* certain no lady would have liked to be recognised in one—but the Cora Pearl of the hour was on view, and habitués of the place pointed out to the neophyte this famous jockey and that notable bruiser. The younger generation in the stalls was probably there on the sly, and would hardly have been surprised by the question, "Does your mother know you're out?" A good deal of strong drink was on order—the alcoholic joke was a favourite on the stage—and there were nastier jokes than that. At present the consumption of spirits in the music-halls is rather small, and establishments licensed by the County Council may not sell intoxicants of any kind. They are, in fact, easily dispensed with. Amuse your audience, and they are quite satisfied with coffee and ginger-ale.

While contrasting the new halls with the old, let me note the recent visit of Queen Alexandra and her daughter to the Alhambra.

These new-fashioned pleasure houses are costly things to run. My readers are not, I daresay, yearning to wallow in figures, and I will be sparing in the use of them. Here, from the most recent balance-sheets, are a few which concern seven of the leading London halls.

	Receipts.			Expenditure.			Profits.		
	£	s.	d.	£	s.	d.	£	s.	d.
A.	66,891	14	2	55,154	7	4	11,737	6	10
B.	63,269	5	11	40,184	6	6	23,084	19	5
C.	46,388	8	5	39,326	13	6	7,061	14	11
D.	69,641	7	3	51,029	3	0	18,612	4	3
E.	109,318	15	10	95,588	15	4	13,730	0	6
F.	31,486	9	1	22,927	11	3	8,558	17	10
G.	86,821	6	0	77,858	9	10	8,962	16	2

It will be seen that the expenditure in every instance reaches a very high total. One house, taking over £2000 a week, has outgoings amounting to nearly £96,000 in the year. The profits are nevertheless very good in the main. The second on the list is the Pavilion, and the fourth the Oxford, and both of these come out extremely well. Let your inevitable expenses be what they may, shrewd management is bound to tell.

And what are these inevitable expenses?

Mayhap the reader, when next he visits any popular hall in the West-end of town, will take note of sundry things. The building itself is in the style, and has the refinement of, a first-class London theatre. The music-hall of the eighties was a kind of barn; but you could not nowadays put up a new variety theatre in any fashionable quarter of London at a cost smaller than from thirty thousand to forty thousand pounds. Decoration, fittings,

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furniture, lighting—these must all be up to a standard unknown to and undreamt of by the old-time patron of the old-time music-hall. Feel the carpet you tread on, and the chair you sit in: you are in your club. With these luxuries then the expenses of the management begin. If there is rent to pay, it is a tremendous item. Take the Canterbury, an ancient and celebrated house on the southern side of the river, in a region not exactly modish. I select the Canterbury in especial, for here it was that old Charles Morton, who died the other day at nearly ninety years of age, set out upon the task of reforming and transforming the music-hall. The story of the Canterbury, were there space to tell it, would illustrate the successive changes from the prehistoric style to the completely new. Well, leaving salaries and wages out of account, the rent of the Canterbury, in the unmodish south, is £180 a week. We are started on a moderately big budget.

But, if started, we are no more than started. Advertising in the newspapers will cost not much less than £80 a week, and bill-posting may mean another £20: the salary of a Judge of the High Court for this sole item. The outlay on printing, stationery, programmes, and such trifles, might almost keep a Marquis of Anglesey in waistcoats. Scenery accounts for a big bill in many halls; and redecoration and repairs, with renewals of furniture and fittings, are expenses common to all.

As yet, however, we are but getting warm on the subject of expenditure. Consider the wages and the salaries. The permanent staff (including the artists) of any large and well-to-do theatre of varieties numbers not fewer than a hundred persons. There are the manager, the acting-manager (who looks after the "front" of the house), the secretary, and clerks. There is the orchestra. We have been hearing of late that opera cannot be mounted in the provinces because the provincial theatre cannot find musicians. The London music-hall manager, up to date in most things, knows that good music attracts a popular audience, and he takes care to have it on the premises. It may cost him only a thousand a year; it is much more likely to cost him three thousand or four thousand.

Then comes your miscellaneous staff of carpenters, painters, scene-shifters, liveried attendants, waiters, bar-tenders, programme sellers, and cleaners: labour both skilled and unskilled, punctually paid at Saturday's treasury.

But all these expenses are as nothing in comparison with the salaries of the artists. It may be seen from the figures just set down that seven London music-halls take between them in a twelvemonth nearly half a million of money paid by the public for admission; also that their expenditure for this period totals over three hundred and eighty thousand. The greater part of this enormous sum goes into the pockets of the performers.

In the first volume of his delightful "Reminiscences," Lord Brampton tells us that when his services were extraordinarily in demand in connection with election petitions, he put on a fee which he thought would be prohibitory. "How much have you put on?" asked Baron Martin. "Five hundred guineas, and two hundred a day." The Baron chuckled. "A prohibitory fee! They must have you, Hawkins—they must have you. Put on what you like; make it high enough, and they'll have you all the more." They did. Now from time to time some favoured comedian of the halls puts on what he likes, makes it high enough, and they have him all the more. It happens seldom, to be sure—or the music-halls would not be paying 10 and 12 per cent. The stars of the variety theatre are few, and have not at any time been numerous. But when a Leno attains to his zenith he has, practically speaking, no prohibitory fee. He was worth £250 a week to the management of Drury Lane, and is believed to have been earning during some years at the rate of about £15,000 a year. "The popular history of the English stage for the next ten years," according to Mr. Bernard Shaw in 1898, "will be the history of Miss Louie Freear and Mr. Dan Leno." Leno's art defied analysis. Wherever it lay it was individual and not to be communicated. He could seldom, it was said, get any one to write for him the things he could deliver most tellingly, and made them up for himself on solitary rambles, Brixton wondering the while what practical joke engaged him. Dan Leno was the best illustration in his day of the familiar formula that the artist of the music-halls is born into the profession. These entertainers, to whom we owe so much, seem almost a race apart.

It is the singer of the comic song who turns the money in. The comic song is, and has always been, the stay of the music-hall. "We manage to make them laugh," says Mr. George Robey, modestly; and in saying that he really says all. Happy the artist whose talent lies here. As champion clog-dancer, Leno was that and nothing more; as the creator of the

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"Shop-walker," he drew the town, and a weekly salary equal to the year's earnings of two curates. Ten, twenty, thirty, or forty pounds a week represent the salaries of others who are well up the ladder, but whose names in the bill do not as yet suffice to pack the house. A lady comic in the front rank is worth pretty much what she chooses to ask. Miss Marie Lloyd, I venture to suggest, does not come off lightly with the Commissioners of Income Tax.

The comic song, then (which as a rule is easier to sing than to get), in the long run, wins most in this arena; but the music-hall is open to all the talents. People who will do their nightly utmost to break their necks may obtain, for short engagements, the highest terms of all. The little French lady who first looped the loop in London was said to receive about £500 a week. She did not at all enjoy her performance, but had the off chance of netting a comfortable fortune in a year or two—and I hope has netted it by now. Since the days of Leotard (how tame that daring man would seem to us!), the "turn," which may be described as a nightly attempt at suicide, has been in hotter and hotter request, and is perhaps the least commendable item on the programme. More to be admired, surely, is the exquisite work of the conjuror, who devotes as many months to making one trick perfect as Mr. Hall Caine to writing a romance.

The artist, working for himself, finds it difficult to keep his foot on the slippery ground of competition; but he does enough if he holds his own. The manager's risk extends to the whole business of his hall. He is the more or less friendly rival of every other manager. He has to assure himself that all the items in his programme are attractive, that no item is objectionable, and that he is getting his share of the novelties. Receipts rise and fall unaccountably, but if they fall to a point at which the shareholders ask questions there is generally something wrong. The artist settles his account at the footlights; the managing director at his annual meeting—and the balance-sheet shows the stability of the concern.

Competition and the ever-present thought of dividends keep the managing director on the alert. In the interests of the show he visits Paris, Berlin, Vienna, St. Petersburg. He is in touch with New York; our variety artists are welcomed in America, and from America some charming performers have come to us. As a rule, songs in a strange language are received wth little enthusiasm in the London music-halls, but the Alhambra has often made them popular. Some day, perhaps, when the international language problem has been settled, we shall have an interlude by Chinese comedians in Esperanto. Meanwhile, we have had wrestlers from Turkey and Japan, and dancers from Madrid have challenged the sylphs of Paris. In his anxiety to please everybody the showman has taken science and the healing art under his protection. The bioscope has long been with us; liquid air, associated with a "magic kettle" (and, perhaps, a trifle too much mystery), is an "act" at the Palace Theatre; and at the time of writing the most admired "turn" at the Canterbury is an exhibition of treatment by electricity. This is not remotely like the eighties. It would be a task at once difficult and thankless to attempt to classify the many metropolitan halls; enough to say that there is choice both for the man who prefers to amuse himself with his family and for the man who does not.

A word on the subject of the sketch or small drama which now and then brings the management into trouble. The sketch is proceeded against, not because it is an improper performance, but because the theatres are jealous of the music-halls. The music-halls have been doing very well of late, the theatres not quite so well; and gentlemen who are professionally interested in the "legitimate" drama would like to keep it to themselves. The Committee of 1892 recommended that in the theatres of varieties "it be made lawful, without the possession of a licence for stage plays, publicly to present ballet, ballet divertissement, or ballet of action, and those performances commonly called sketches, if the duration of each such performance shall not exceed forty minutes, and no more than six principal performers take part therein, and if there shall be an interval of at least thirty minutes between any two such sketches; and no two sketches performed on the same evening at such place of public entertainment shall have a connected plot." The music-halls claim no more than this, but this they do claim, and if they stick long enough to their point they will gain it. The general voice is with them in this matter.

Talent of every kind enters the music-halls, and is liberally rewarded; let the beginner in the provinces remember that particular stars in London earn something like £1 a minute.

There is but to add that in all matters of charity the music-hall sustains comparison with the theatre.

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HOW TO BUILD A CHEAP BUNGALOW*

TYPES OF COUNTRY DWELLINGS FOR PEOPLE OF MODERATE MEANS—
SPECIAL ESTIMATES AND PLANS, AND PRACTICAL HINTS

BY

"HOME COUNTIES"

Illustrated from photographs and drawings specially prepared for THE WORLD'S WORK AND PLAY

LAST month I offered my best advice on the finding of a cottage in the country, on the overhauling of an old cottage, and on the cost of building a new cottage. I then went into details as to what could be provided for about £1000 and upwards.

But we are not all inclined to spend £1000 on a week-end cottage, or even on a cottage to "retire" to at the close of a town career. This month, therefore, I propose to set before my readers the best information I have been able to gather together as to the cost of less expensive houses than those described in our December issue.

I. THE CHEAPEST AN ARCHITECT DESIGNS

First, however, following closely after last month's article, let us consider the lowest-priced bungalows I have noticed, designed by an architect. These are four in Mr. R. A. Briggs' *Bungalows and Country Cottages* (Batsford, 12*s.* 6*d.* net). This book is in a fifth edition, and the author says he has brought up his prices for labour and materials to 1901. I make his pounds guineas, however, to be on the safe side in 1905.

At 400 guineas he offers a bungalow with verandah, large dining-room and tower-window sitting-room, three bedrooms, kitchen, and offices. The walls are of studwork covered with felt and weather-boarding, oiled, stained, and varnished, or dwarf-brick walls. The roofs are tiled and the walls inside plastered. All woodwork but weather-board is painted ivory white.

The 600-guineas design shows similar accommodation and walls of brick faced with rubble or rough-cast, and roof thatched. A hall-sitting-room is provided. The bedrooms would be cut off by a door into the passage giving access to them, which is a necessary arrangement for bungalows on one floor. The woodwork would be white throughout except louvre shutters, which might be green.

For 700 guineas we have a bungalow of two storeys. On the floor are verandah, sitting-room, hall, kitchen, and offices. Upstairs we find four bedrooms and balcony. The ground-floor walls are of brick, the first-floor walls of studwork covered with tiles.

At 800 guineas we are given five bedrooms, with dining-room, sitting-room, kitchen, and offices, piazza, and covered seats all on the ground. The walls would be brick or rubble, and the *voussoirs* of the principal entrance stone. The chimneys would be faced with stone and the roofs would be tiled.

Mr. Briggs makes an interesting distinction between cottages and bungalows. "A cottage is a little house in the country, but a bungalow is a little country house—a homely, cosy place, with verandahs, and balconies, and the plan so arranged as to ensure complete comfort, with a feeling of rusticity and ease." One useful hint of his—that the entrance should be placed away from the garden so as to give privacy to that invaluable adjunct to a dwelling-place in the country—is worth noting. I am glad to see Mr. Briggs laying stress on the need of carefully laying out the garden, "even to the smallest details, such as gates and fencing." As he says, what lends so great a charm to many old country houses is their gardens, and some of this charm can only be obtained by devoting attention to the new bungalow's

* See also the following fully illustrated articles by "Home Counties" in previous issues: "Cheap Country Cottages: an Authoritative Account of the Legal Difficulties and how they may be got over" (October); "Cheap Country Cottages: Practical Hints about Building them" (November); and "Bungalows for People of Moderate Means" (December).

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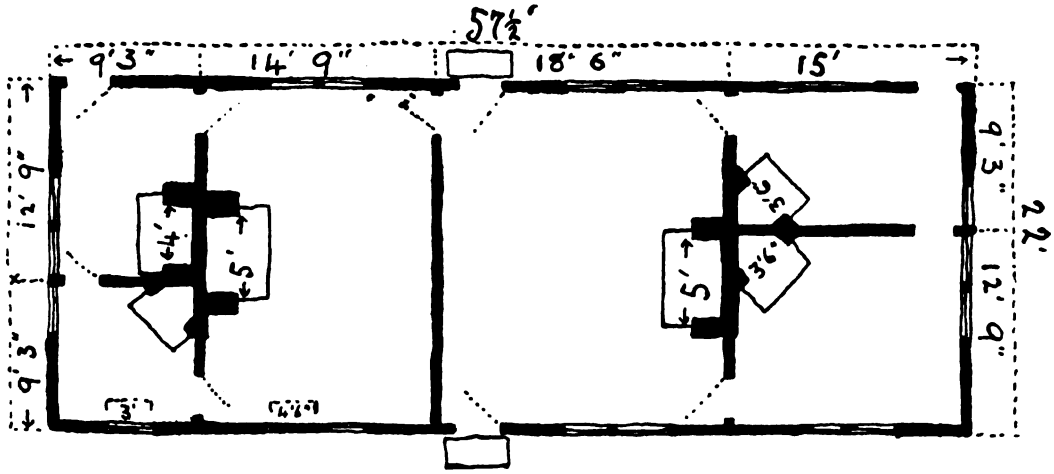

PLAN OF MR. BLUNT'S OWN CORRUGATED IRON BUNGALOW

gardens. This means money, of course, and so I suggest that the would-be bungalow-builder should not spend all his money with his builder.

Mr. Briggs declares that it is cheaper to have a house of two storeys with the bedrooms partly in the roof than to have all the rooms on one floor. He thinks stud walls covered with tiles, weather-boarding, and rough-cast "warmer and drier in winter, and cooler in the summer than nine-inch brick walls." While, as will have been seen from my notes on some of his designs, Mr. Briggs is a believer in verandahs, he gives the needed caution against so constructing them that they shut out the light. Light, more light, must be the motto of the instructed bungalow-builder. One of the ways of keeping the bungalow light is of course to paint all inside walls and ceilings white.

II. THE CASE FOR PORTABLE COTTAGES

One of the arguments for cottage-building instead of cottage-renting is that cottages are seldom forthcoming on the finest sites. How many ideal sites one finds on the Welsh and Scottish coasts where one would gladly rent a cottage! But even on these ideal sites—they are not often to let for building, but sometimes they are available—there is a hesitancy about putting up an elaborate dwelling of bricks and mortar. Here comes the opening for the portable cottage.

Mr. D. Allport (of the Wire-Wove Company) places at my disposal some data which he put together some years ago in a little book on portable holiday homes, which is no longer in circulation. He points out that such dwellings, or rather their sills or plates on which the floor-joists lie, rest on railway-sleepers laid on shallow trenches of concrete. The great advantage of a wire-wove building is its lightness. In building an ordinary house, as Mr. Allport explains, an immense amount of heavy material is used for the sole purpose of sustaining other heavy material, and not because it is needed to resist the weather. A roof of slate or tiles weighs tons, but even this weight does not ensure stability, for a storm may strip off part of the covering. Mr. Allport argues that his wire-wove material, though it has less than a tenth of the weight of a tiled roof of the same size, has a strength far greater, for it depends upon the tenacity of steel. "A gang of heavy men might walk over one of these sheeted roofs without doing nearly so much damage as one man would do on a slated roof, and without causing any leak whatever. The same considerations apply to the outer walls, which are constructed on the same principle, and of the same materials as the roof."

The inside walls of a wire-wove building are of the same material as roof and outer walls with the wire netting left out of it. The material forms such a good substance for painting on that a "canvas" exhibited at the Grosvenor Gallery a few years ago consisted of a wire-wove sheet. "The resistance to wet and damp is absolute," and the space between the inner and the outer walls being left empty there is an air barrier which prevents the outside heat from penetrating in summer and the inside warmth from escaping in winter.

Mr. Allport believes in a brick open hearth, with a chimney of terra-cotta pipes, and makes the useful suggestion that a wooden compart-

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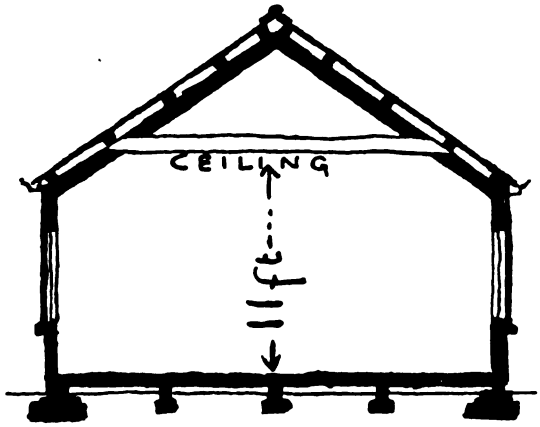

MR. BLUNT'S BUNGALOW—END ELEVATION

ment built round these would make a fine drying-closet.

Another of his hints is to economise room by using in the square dining-room a round table which may be separated and stood against the wall. "A table of five feet diameter has been known to accommodate twelve people, and one of five and a half feet would do so easily."

Mr. Allport proceeds to advise against using, where avoidable, woollen materials or bright iron or steel articles in a bungalow or cottage which has to be shut up. His plan when about to leave a house is to have the various woollen articles—blankets, rugs, and clothes—laid in a heap, "each article being sprayed in turn with a solution of 12 grains of corrosive sublimate in a pint of warm water." The quantity of the poison used is minute enough to cause no danger in using the articles later on, but sufficient to keep off insects.

This experimenter in bungalows prefers an American range to one set by bricklayers. The chimney-pipe goes out through a hole in an iron plate in the roof. As the edges of the hole are turned up and a strip of felt is bound round the chimney with wire further up, the wet does not come in.

It should be clearly understood that Mr. Allport was writing of "holiday homes," and twelve years ago. Nowadays, people seem disposed to build more permanently in the country than they were formerly inclined to do. And as Mr. Allport said to me, when ground is freehold it would be a mistake not to build in a more permanent fashion than would do for a mere week-end place. The portable building is particularly suitable for building on rented land. It is a tenant's fixture. Of course if a brick chimney and brick foundations were put in they would have to remain; but neither of these things is necessary in a temporary building. For the whole law of landlord and tenant as to fixtures, by the way, I know nothing plainer than a little half-crown manual published by Clement Wilson, *Fixtures and Repairs*.

When a bungalow is actually portable, the owner, when inclined to "move on," is in a position to negotiate with his landlord. Some portable bungalows are portable only in name. I think I should advise the builder of a bungalow not really to contemplate removing it. If his fancy as to the most desirable site for a holiday home changes, it will probably be as advantageous to sell the dwelling, as to take it down, transport it, and re-erect it. Also he will have thought of improvements in design he will want to try. The moving of a £300 structure I have in mind some half-mile and the re-erecting of it cost £40.

Of all "pigs in a poke" to buy the second-hand bungalow, purchased with the intention of removing it, is likely to prove one of the most exasperating. I heard lately of a man who obtained an estimate for a new structure. The price was £220. During the negotiations he met with a building which the owner offered him standing for £60. Thinking he had come upon a bargain, he closed with this offer. Before he had paid for taking down, transport, and re-erection, however, he had spent more than the £220 of the original estimate—for a second-hand article.

One of the chief points I noticed in Mr. Allport's own bungalow, illustrated in the last issue of this magazine, was its simplicity. A mild stain was used indoors, but no paint or varnish, and much of the wood was left in the rough. I may add that for wood which is exposed to the weather, Pilcher's "stoprot" and carbolineum are both unrivalled protectors.

III. AN IRON BUNGALOW FOR £380

Mr. Wilfrid Scawen Blunt has kindly sent me the plans and specifications of the corrugated-iron and wood bungalow built for his own use in the New Forest by Messrs. Humphreys in 1899. (This is not the same structure as the simpler and cheaper building put up for a forester, and illustrated in the October WORLD'S WORK.) It will be seen that the estimate was for £227 10s. The foundations, chimney, and extras brought the cost of the building up to £300, which Mr. Blunt, who has had considerable experience of building, considers "very cheap."

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DESIGN FOR A £300 BUNGALOW

(By David Rowell and Co., Westminster)

SIDE ELEVATION

" It is right, however, to say," he adds, " that I applied to Humphreys two years ago for another, and found their prices had gone up, if I remember rightly, 30 per cent." This would bring up the price of a similar building nowadays to perhaps £380. It may be mentioned that since Mr. Blunt's bungalow was put up he has added to it a verandah on the north side, and two wings. But I do not go into the expense of these, as the dwelling as shown in the plan is typical as it is of many readers' requirements.

The specifications to which I refer were as follows :

" We propose to supply and erect in a substantial manner, a galvanised corrugated iron building as tracing submitted [*see* sketches], according to the following specification :-

" Size of building to be 57 ft. 6 in. long, 22 ft. wide, height to eaves 9 ft., height to ridge proportionate.

" The wall framings are constructed of good strong yellow timber, mortised and tenoned, so as to be easily taken down for re-erection, without injuring the structure.

" The principals to be 2 in. by 6 in., purlins to be 2 in. by 4 in., the other parts to be in proportion, and to be so constructed and attached as to give great strength at each joint.

" The floor-joists 2 in. by 4½ in., and sleeper wall-plates 2 in. by 4 in., to be sound strong timber, thoroughly and substantially fixed at the joints and properly secured to the wall and foundation timbers.

" The floor to be sound 1¼-in. boarding, planed, tongued, and grooved, nailed on joists 15 in. apart.

" The whole of the interior is supplied throughout with ¾-in. white match-boarding—wrought and beaded, which can be fixed under the collars 11 ft. from floor to form ceiling, thus affording good height for ventilation, the boards to be seasoned, and fit for occupation the same day as fixed.

" The whole of gables and walls are doubly lined throughout with inodorous felt, the roof to have one coating between iron and boarding, allowing an air space between match-boarding, purlins, and iron, to keep the building warm in winter and cool in summer. This system has never been known to fail, when done under our improved principle.

" The whole of the corrugated iron, both of walls and roof, is of the best No. 24 B gauge, well galvanised, and of a quality specially made for galvanising and corrugating, soft and even in temper, without flaws or cracks, well and thickly coated with pure Silesian spelter ; the whole stamped true and exact, so as to make a thoroughly rigid and durable roof. The corrugated iron is put together in the best possible manner ; the seams are single ; and to prevent water lying between the sheets the junctions of walls are made secure and watertight, the whole fastened with conehead galvanised fittings to prevent rust.

" Galvanised ridge-capping is so fixed on the apex of roof as to allow of ventilation the whole length of the building.

" Locks for doors, window fastenings, and necessary ironmongery supplied with each building for the erection of our work.

" Windows, special sizes, well seasoned, are supplied and fixed according to plan, part of the window to open for ventilation.

" All windows glazed with good 26-oz. clear glass.

" All doors, stock sizes, to be of the following dimensions : outer doors, 1¾ and 2 in. thick ; inner doors, 1¼ in. thick—suitable posts inside and outside.

" Necessary lead-flashing round chimneys.

" Ventilation is provided by special flaps in ceilings filled in with perforated zinc and also louvres to gables, in addition to the opening of windows.

" All the outside wood-work of doors, window-sashes, &c., is painted with two coats of good oil-paint, green, in addition to painting before leaving our works.

" The foundation required is of about four courses of brickwork ; we send instructions and ground plan to the customer to hand to a local bricklayer, charges should be according to ground level.

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"The erection of the building is to be completed within twenty-three working days from date of possession of foundation.

"The railway carriage and cartage is free to the nearest station to site, the purchaser to cart the goods from local station.

"Workmen's lodgings and fares included in the estimate.

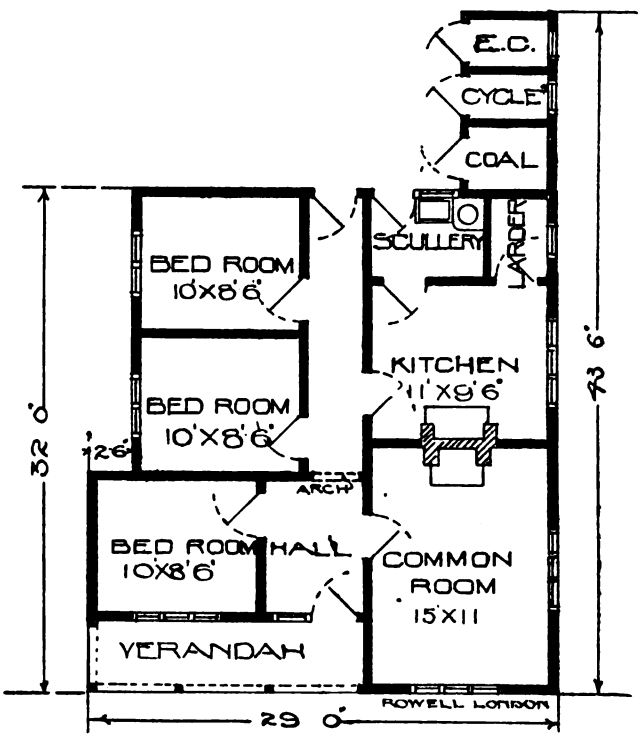
"Until fully paid for, the title and ownership of this building shall remain the property of Humphreys, Limited, and the same shall not be subject to any mortgage of the land on which it may be fixed.

"Price for the building as above specified: Two hundred and twenty-seven pounds ten shillings, payable as follows, to wit: a deposit of 20 per cent. on signing this contract; 70 per cent. as the work proceeds; and the balance upon taking possession.

"The following are not included in contract, viz., foundations, chimneys, grates, hearths, chimney-pieces, drainage, gutters, thatching and battening for same, painting iron, interior decorating such as painting or varnishing, or laying on water.

"NOTE.—We ask careful comparison of specification, architectural and structural details. A building of lighter and cheaper construction might be erected at a lower price, but these cheap and flimsy structures are most unsatisfactory and uncomfortable, and when done with are difficult to dispose of; whereas a neatly designed and well-built building such as we quote for can, as a rule, be readily sold after a few years' use for a greater part of its first cost; the whole of the parts being specially made to take apart for additions, removal, or alterations."

FRONT ELEVATION



PLAN

IV. ANOTHER AT TWO HUNDRED GUINEAS

It is interesting to compare with the foregoing estimate of what can be done in iron at £380 an estimate for an iron bungalow at two hundred guineas, submitted by Messrs. T. J. Hawkins and Company, of Ashford, Middlesex. They emphasise the fact, first, that their prices are due to "careful standardising of sizes and consequent economy of material and time"; secondly, that "iron buildings if lined with boards immediately under the iron sheeting in addition to the inside boarding (enabling the felt to be evenly laid and preventing the sagging which otherwise lessens its efficiency) are warmer in winter, and as cool in summer as brick buildings. This has been practically demonstrated by comparisons between the two built for the East Sussex County Asylum Committee, a careful series of tests having been instituted."

Messrs. Hawkins' estimate is for erection "in any town or village in England." The bungalow is to be 34 ft. long, 20 ft. wide, and 9 ft. to eaves, exclusive of foundation. The specifications are as follows:

"The framing to be of good strong timber of following proportions: Corner posts 4 in. × 4 in., plate 4 in. × 3 in., principals 7 in. × 2½ in.

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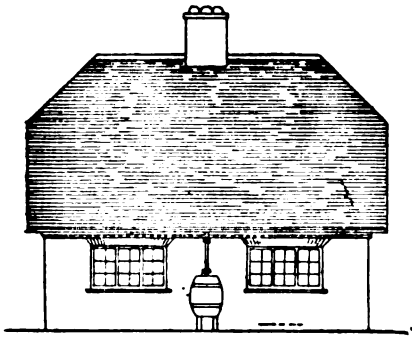

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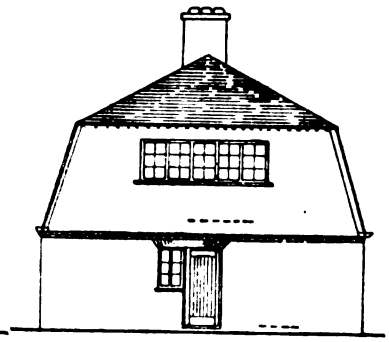

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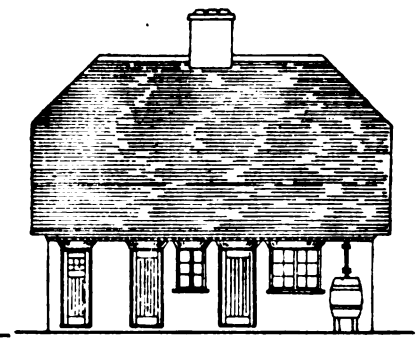
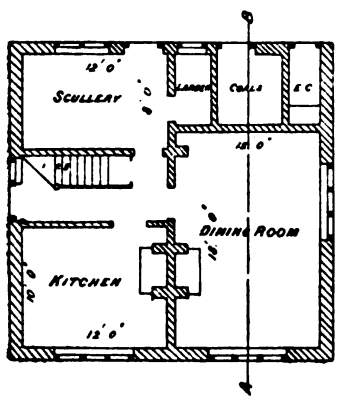
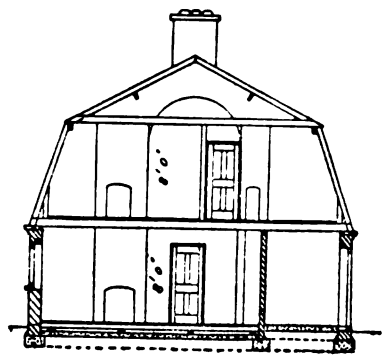


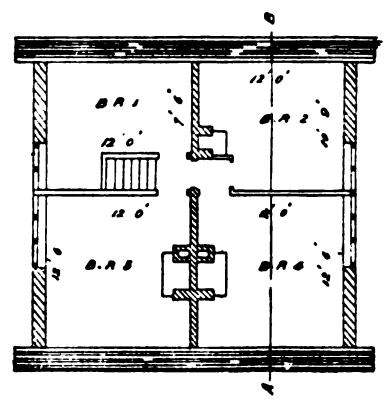
— BACK ELEVATION —



— GROUND PLAN —



— SECTION A.B. —



— BEDROOM PLAN —

£240 BUNGALOW KINDLY DESIGNED BY MR. A. H. CLOUGH FOR "WORLD'S WORK AND PLAY"

Purlins, horizontals, uprights 4 in. × 2 in. The uprights to be morticed and tenoned into plates, and the principals to be secured by collars. The floor joists and sleeper wall plates 4 in. × 2 in. to be sound strong timber, and the joists to be only 12 in. apart. The floor to be good seasoned 1-in. deal, tongued and grooved, firmly fixed to the joists with 2½-in. floor brads. The whole of the interior to be match boarded with ⅜-in. white matching, ceiled at eaves.

"The whole of the exterior of the building to be lined throughout with felt, allowing air space between matching and iron, to keep the building warm in winter and cool in summer.

"The iron to be of the best corrugated, 24 gauge, well and evenly rolled and well coated with Silesian spelter, even in temper and without cracks or flaws, and to be securely fixed with 2½-in. cone headed nails and washers, and the apex to have galvanised ridge capping so fixed as to allow ventilation along the entire length of roof. 4½-in. O.G. Gutters, down pipes, &c., supplied to eaves of main building. Locks for doors, window fastenings, and necessary ironmongery supplied to the building. Window sashes to be as shown with upper parts to swing inwards for ventilation. The lower parts to be glazed with ⅛-in. Hartley's rolled plate. and the upper parts with 21-oz. clear glass. In side basis (if any), to be 1½ in. thick, and outer doors 1½ in. or 2 in., according to their size, properly hung to good framing. All the outside woodwork to be twice painted in good oil colour, and the inside to be sized, stained, and varnished.

"Plans will be supplied of the required foundation. Customers to cart all materials from railway station to building site at own expense. The building to be erected in a sound, workmanlike manner, and to be completed in twenty-four working days."

The firm put down the following extras:

	£	s.	d.
Foundations and chimneys	22	10	0
Portable copper	2	10	0
Sink	1	10	0
Earth closet adjoining or in separate building	7	10	0
Portable range fixed complete	5	10	0
Dresser and few shelves	2	0	0
Add Bungalow per estimate	120	0	0
	£161	10	0

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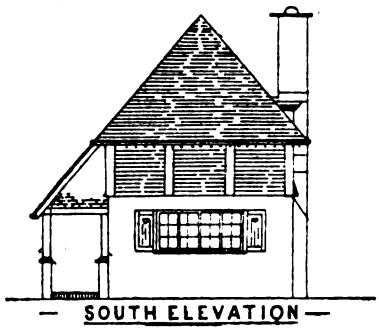
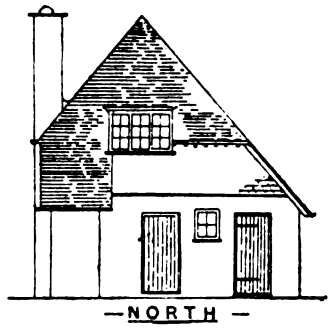
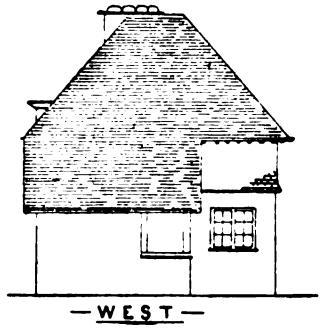
If the building is lined with fire-resisting material instead of matching, and a fire-proof floor is put down —as folk nervous about fire would be well advised to specify, and then they would feel perfectly at ease—the price would be, I am told, £198. I think we should also add the expense of carting and the cost of, at least, two fire-grates, a couple of cupboards, a coal and wood shed, and painting the roof and walls what we may call Russian green, two coats. These items would bring the bill up to something like £216. Provision is already made for cementing the floors, the verandah, and a space at the back door.

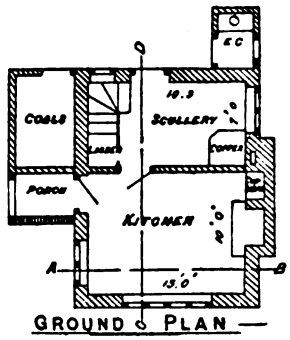
V. A WOODEN BUNGALOW FOR £380

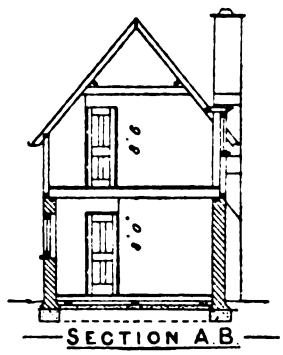
The plan on page 181 shows a bungalow offered by Messrs. Rowell and Co. for £290. The walls from the footings up to the windows are of weatherboard; above that, match-board. The roofing is 24-gauge Canadian roofing. This is more sightly than corrugated iron, because it is fluted only at the joinings. The material may often be seen used for the shelters over the platforms of small railway stations. It is dearer than corrugated iron. The advantage of Canadian roofing is that it necessitates boarding the roof; corrugated iron "carries itself." Felt is placed between the roofing and the interior match-boarding. The Canadian roofing would receive adequate painting. If Broseley tiles are wanted instead of any sort of iron roofing, the price would be £15 or £20 more. Some of this expense is due to the fact

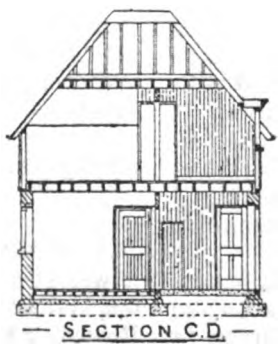


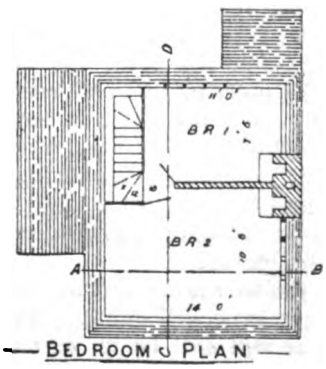












A £130 BUNGALOW SPECIALLY DESIGNED BY MR. CLOUGH

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that the roof and its main supports would have to be strengthened for the additional weight. All the outside woodwork would be properly painted. The match-boarding inside, of which the walls and ceiling consist, would be stained and varnished, and other wood painted. The floors are of inch-tongued board. A sink and all guttering and rain-water pipes would be provided. The building could be put up in six weeks.

Now for extras. I make them out to be something like this :

Concrete, £10 ; brick footings and chimneys, £35 ; range, stove, and mantels, bath, cement at doorstep, bricked walk, a drain to the sink, and waterbutts, £20.

In all £65. The bricklayers' work would be done on the (free) plans supplied by the contractors, by a local builder employed by the buyer of the bungalow, or if requested, by the contractors. Possibly there might be a request for cartage from the station if the railway company would not deliver the materials. This might mean a sovereign, but I should grudge it on a bill of this size. Let us say for the whole job £355, or with the tiles £375. Indeed, I believe Messrs. Rowell would guarantee that for this sum the owner should be able to go into the bungalow without spending a penny more except for furniture.

It must be admitted that the design of the little house promises a pretty structure. The only improvement I can suggest on the plan as it stands is oak sills instead of deal sills, and if the Canadian roofing is used, 22 gauge instead of 24. *How to Estimate* (Batsford) recommends 18 or 20 gauge ; but this is probably specified for roofing which is not to be painted. And Messrs. Rowell are willing to paint theirs well. I do not believe a bit in galvanised iron roofing which is not painted. I know it is contended—I had a builder arguing with me the other day—that it will not rust ; but that is all nonsense. It will. It is impossible for the edges and for the holes made for the nails to be so thoroughly covered with spelter that no wet can get at the iron. If papered walls are wanted, a deduction could, no doubt, be got for non-staining and non-varnishing, and this amount applied to the covering of the match-boarding with scrim canvas to receive the wallpaper.

If the woodwork and ironwork of this bungalow are kept well painted, its designers declare that it will still be in very good condition in sixty years. Well, that is as long as most of us will need a bungalow.

How does this plan for a cottage in the country strike one ? It is obviously planned in a way which makes the dwelling easily managed, it is light, and the absence of stairs saves a great deal of exertion. On the other hand, if the servant girl leaves her bedroom-door open, as servant girls will, and her bedroom is not too tidy, the vicar's wife when she makes her call will have something to tell the doctor's wife about the new bungalow. Again, the water closet faces the kitchen-door. It ought not to be a water closet at all, but an earth closet and it ought to be outside with a coal house and a bicycle shed. The kitchen would be the better for having any space saved thrown into it. The next point which suggests itself is that there ought to be a window at the end of the passage. Finally, one notes that, with one bedroom given up to the servant girl—such a room would not hold two servant girls, and many housewives would say that one girl " sleeping in " could do the work of a house of only five rooms—all the accommodation remaining is two bedrooms, a sitting-room and a dining-room.

This is not very much for—I am counting in the cost of the tiles and the proposed alterations of the plans—say, £400. Knock off the tiles and the expenditure is still £380 ; and if one built the place as a speculation, and looked for the 8 per cent. brick or stone property is supposed to yield, the rent should be £29, plus rates and taxes. Well, this is a good deal. I have not met many Back-to-the-Landers house-hunting apparently willing to give such a rent for so little accommodation. I am not saying the bungalow is not good value. I think indeed it would probably turn out a pretty and comfortable little place ; but in figuring out the cost of building a cottage in the country it is wise to be under no delusions as to the expenditure involved, and as to how much of that expenditure has to be written off for the pleasure of having one's own place and for seaside-lodging charges saved by its possession.

I should perhaps add that rooms could be added on to the bungalow at 4*s*. 6*d*. or 5*s*. per superficial foot of floor-space, according to whether Canadian roofing or tiles were the roofing material.

VI. ANOTHER AT £300

After the foregoing chapter was in type—it was one of the parts of my article crowded out last month—I sent a proof of it to Messrs. Rowell on the chance of their caring to take up some of the points raised. They promptly prepared for me a new design, in which it will

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£100 WEEK-END COTTAGE

Designed for World's Work and Play by the Wire Wove Company. Living-room (14 ft. 3 in. × 11 ft. 7 in.), kitchen and one bedroom (each 11 ft. 7 in. × 8 ft. 9 in.), one bedroom (11 ft. 6 in. × 8 ft. 9 in.), porch, E.C., wood shed, and larder. Carriage paid. Purchaser and a labourer could erect in three or four days. Includes foundation shoes but no stoves. Labour, E.C. fittings, range and two stoves and pipes, gutters, and water-butt could be got for £10

be seen my criticisms have been considered, and wrote me as follows :

"Dear Sir.—We have pleasure in enclosing a detailed specification and a drawing showing a well-constructed bungalow which we estimate could be built for £300 ready for purchaser to take possession. This price would include all extras as detailed in our estimate enclosed.

"The space in roof could easily be used for storage purposes or for tanks for hot water, without any additional cost, or for a small additional sum the roof space could be utilised and made into a nice bedroom.

"If our customer would not trouble much about the appearance of the building outside, we could make a plain roof running straight from back to front at less cost; in fact we might reduce our price some £10 on this account, but we think the elevation we show is worth this extra money.

"We would like to point out that we show our design with a tiled roof, and if it is carried out as shown the building is practically a permanent one, and would make a most comfortable and compact bungalow to live in.

"If the roof is covered with our special Canadian pattern galvanised iron, laid on three-quarter rough boards, and painted two coats good oxide paint in place of the tiles, we could reduce our price £25, which would make the building come out at £275, including all extras. The roof in this case would be a little under the 45° pitch that is essential when tiles are used, and as an extra preventative against rusting or wet getting through the screw holes in the Canadian iron after sheets are laid we would arrange to use india-rubber washers as well as the ordinary washers. This makes, as we can prove from long experience, an absolutely watertight covering, and is at the same time a very neat one.

"We have not shown any brick fireplaces in the bedroom, but these could be fitted with very neat portable stoves of the Rose Pattern, at £3 10s. each, fixed complete with all necessary protection plates, smoke pipe, and cap.

"We think the item of brickwork and concreting could be reduced in localities where bricks are handy for the site and by employing an ordinary bricklayer, and not a builder or contractor to do this part of the work, and buying the materials separately. We would, in this case, be quite willing to send a competent representative to set out the site, and with the aid of our detailed foundation drawings, the bricklayer would not find the work difficult.

"Specification and Estimate

"*Covering.*—The roof to be covered with Broseley or similar tiling laid on 1" feather edge boarding in narrow widths. The sides to be covered with 1" feather edge boarding, 1" matchboarding in gables with overlays of half timbering as shown.

"*Gutters and Spouts.*—Necessary 4½" cast-iron Ogee eaves gutter, with outlets and stop ends and 2½" cast-iron down pipes, shoes, &c. No drains.

"*Framing.*—Strong timber framing properly mortised and tenoned together where necessary. Framing

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£400 COMPLETE (WIRE-WOVE COMPANY)

Dining-room (18 ft. × 12 ft.), drawing-room (16 ft. by 12 ft.), three bedrooms (16 ft. × 12 ft., 12 ft. × 10 ft., 12 ft. × 10 ft.), kitchen (16 ft. × 12 ft.), bathroom (13 ft. × 6 ft.), and hall. With two large attics, £450

4″ × 4″ and 4″ × 2″. 4″ × 2″ common rafters and collars spaced 12″ apart.

"*Lining.*—The interior of building to be lined throughout with usual ⅝″ planed, tongued, grooved, and beaded white matchboarding.

"*Partition.*—Framed of 3″ × 3″ and 3″ × 2″ and matchboarded both sides.

"*Felting.*—A layer of patent inodorous felt to be fixed between the boarding and outside covering to walls and roof.

"*Flashing.*—Lead flashing where necessary.

"*Flooring.*—The flooring to be 1″ planed, tongued, and grooved flooring boards laid on 4″ × 2″ joists about 12″ apart in the clear on 3″ × 2″ sleeper plates.

"*Doors and Windows.*—Half glazed and four-panel timber doors with good furniture. Timber framed windows glazed with 21 oz. clear glass. All windows made to open, and fitted with set opes and fastenings.

"*Barge Boards,* &c., necessary fascias and barge boards.

"*Holding down Bolts.*—These will be provided.

"*Varnishing and Painting.*—The internal boarding to be sized, stained, and varnished, the doors, windows, barge boards, fascias to be painted three coats of good oil paint, and the outer boarding painted three coats and finished approved tint.

"*Outbuildings* as shown on plan.

"*General.*—The work to be carried out in a thorough manner and erected on purchaser's foundation.

"*Price.*—For the building as specified, £238.

"If the roof is covered with our Canadian pattern iron laid on rough boarding in place of Broseley tiling, the roof being of slightly less pitch and the roof sheets being painted two coats oxide paint of a nice tile colour, our price for this building only will be £213.

"The extras in each case would be as follows:

"Portable copper. Stove in common room and kitchener	£13 0s.
"Stoneware sink with lead waste pipe	£1 10s.
"Patent E.C. fixed complete	£4 10s.
"Brick chimney, foundations, concreting and drainage for sink and water-butt	£43 0s.

"We would supply detailed foundation and brickwork plan for your bricklayer to work to free of charge as soon as order is placed with us.

"Terms, net cash, payable one-third on delivery of bulk of material, one-third during progress of erection, and the balance on completion."

If I were having Messrs. Rowell's bungalow I should be inclined to build it with the verandah side facing south. This would make one window of sitting-room face south and the other west. I should alter the window of the bedroom which is entered from the hall to the other interior wall. This would make it private from the verandah, and would ensure all the bedrooms being lighted from the east. With an eastern window it is impossible to be a lieabed in the mornings! It will be noted that both the sitting-room and the kitchen have snug corners.

VII. BUNGALOWS AT £130 AND £240

Among the many letters which the Editor has received is one from a lady in South Kensington, who writes:

"I wish 'Home Counties' would devote an article in your excellent magazine to artistic cottages for gentlewomen at rents varying from £12 to £20 a year, with from a quarter to half an acre of garden, as these are greatly needed both as permanent residences and as rest week-end cottages for those who must live in London."

I at once put myself in communication with Mr. A. H. Clough, photographs of whose pretty cottages, built at a marvellously low cost, appeared in the November issue of THE WORLD'S WORK AND PLAY. This gentleman, with great public spirit, quickly responded with the following letter and the designs, specially drawn for us, which accompany this article:

"I quite agree that it might be useful to publish a plan of a bungalow or small cottage which would be fit for week-enders, and which should be procurable at the lowest possible price. I am sending you two plans, one giving seven rooms for about £240, and the other four rooms for about £110 to £130.

"In the larger one I think only £2 to £3 is sacrificed to decency of appearance. In the smaller the hipped roof is, I think, essential to self-respect, and no doubt £5 to £6 could be saved on that and the chimney.

"The problem in planning this sort of thing is how to make a box presentable. I find a square box less disagreeable than an oblong box. The height is a great difficulty. Rooms eight feet high are essential, I suppose. If they are, the building can't but be rather top-heavy.

"As regards cost I haven't tried building

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these cottages, but I propose to begin the small one as soon as I can find a site which is already somewhat defiled. When it is finished I shall know the exact cost of each item, and will send the list to any one who asks for it."

The following are the prices in detail of the estimate for the £110 cottage. They allow for the builder's profit :

	£	s.	d.
"Excavation	0	9	2
Concrete	5	6	4
Brickwork	32	10	0
Timber framing	10	12	0
Stains	2	15	0
Match-board	1	3	3
External doors	2	10	0
Internal doors	3	10	0
E.C. and coal doors	1	10	0
Windows	10	0	0
Copper	1	10	0
Flooring	2	16	0
Skirting	0	12	6
Window linings	0	16	0
Plastering	8	0	0
Cement floors	1	13	9
Hearths	0	15	0
Paving	0	14	0
Tiling	11	17	6
Guttering	2	17	0
Lead	1	10	0
Grates	3	0	0
Painting	3	0	0
	£109	7	6"

Below are the full specifications :

"SCAFFOLDING, &C.

"Supply all scaffolding, paint, and tools for the execution of the work. Cover all walls during inclement weather, and do all requisite protection to the whole of the work

£275 COMPLETE (WIRE-WOVE COMPANY)

Living-room (14 ft. × 12 ft.), drawing-room (14 ft. × 12 ft.), three bedrooms (14 ft. × 10 ft., 14 ft. × 10 ft., and 10 ft. × 8 ft.), kitchen (12 ft. × 10 ft.), and scullery (12 ft. × 6 ft.)

"EXCAVATOR

"Strip vegetable soil and excavate over site of building to level of underside of concrete under floors.

"Excavate for trenches to the width and depth shown and return, fill in and ram earth round foundations.

"The ballast to be thoroughly clean with a sufficient admixture of sand if necessary

"The lime to be the best chalk lime and Portland cement of the best quality.

SECTION SHOWING FRAMEWORK OF A CORNER OF THE £275 "WIRE-WOVE" BUNGALOW, WITH A FEW SHEETS ALREADY FIXED

"The concrete to be composed of one part of Portland cement to seven parts of ballast and sand. Fill in beneath wood floors and paving with cement concrete as described, 6" thick and levelled on top. Lay similar concrete beneath hearths on ground floor.

"BRICKLAYER

"The bricks to be sound hard ringing bricks for the faced work, and good brick for inside.

"The sand to be clean and sharp and washed for cement work.

"The brickwork to external walls to be 11" hollow walls with galvanised iron ties at proper distances. Internal walls to be 4½" walls as shown.

"The mortar to be in the proportion of one of lime to three of sand.

"Build the footings as shown on plans.

"Lay over all walls at proper levels a damp proof course of slate.

"Finish with a fair face, point with a flat joint, and twice lime wash the walls of coals and E.C.

"Turn rough arches over chimney openings and put wrought-iron chimney bars.

"The ground floor joists to be supported on half-brick sleeper walls built honey-comb.

"Provide proper quantity of cast-iron air inlet for ventilation under floors.

"Provide and fix a 9-gal. galvanised furnace pan and proper furnace door and grating.

"All archings in facings to be 9" deep with properly cut skew backs.

"All chimney stacks to be built the heights shown

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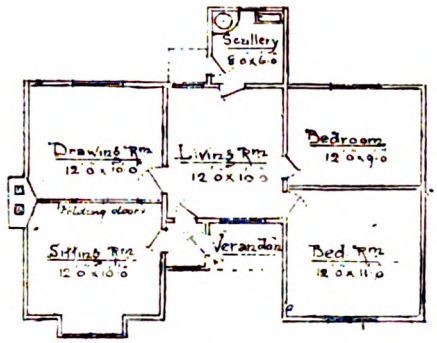

MESSRS. HAWKINS AND COMPANY'S IRON BUNGALOW AT £161 AND EXTRAS

and to have one 9″ terra cotta pot fixed to each flue. Pave coal-house with good hard stocks laid in sand.

"TILES

"Cover the roof with patent interlocking Bridgwater tiles. Finish ridge with plain red, ridge tiles laid and jointed in cement. Leave all tiling perfect and weather proof at completion. Finish hips with cement half round, and put cement flashing where roof meets chimney stacks.

"CARPENTER

"The timber to be sound and well seasoned, free from loose or decayed knots, the whole to be framed together in a workmanlike manner.

"The plates to be in as long lengths as possible, and halved and spiked at angles and joints.

"No joists, rafters, or quartering to be more than 13″ apart.

"Put over all openings where required lintels one inch in depth for every foot of bearing, the minimum depth being 3″.

"Construct the roof and upper portion of framing with 4″ × 3″ plates, 4″ × 2″ rafters, 4″ × 4″ purlins, 4″ × 2″ tie joists, 7″ × 1″. Ridge at sides of all openings put 4″ × 3″. Studs—construction—upstair floors with 8″ × 2″ joists (herring-boned across middle of room) and ground floor with 4″ × 2″ red deal joists the whole of joists to be laid on 4″ × 2″ plates.

"Put proper splayed pitching pieces to a eaves—ends of rafters to be wrought.

"Lay battens to a 13½ gauge for patent tiles.

"Windows to have 4″ × 3″ chamfered frames and 4″ × 3″ oak sills and 4″ × 2″ mullions. Casements to be 1¾″ thick, rebated and moulded, two lights in each window to open where three or more lights are shown, and one light to open in two lighted windows—with proper stay and drop fastening sizes to be taken from plan. Put one inch nosed window boards to all windows. Front door to be 1½″ framed ledge door with ¾″ V jointed matchboard hung with 4″ wrought butts, with Norfolk latch and good stock lock frame to be 4″ × 3″ with oak sill, all other external doors to be 1″ matchboard ledged and braced—frames as before. Put proper 1″ deal rised and hinged seat to E.C. and provide galvanised pail for same.

"All inside doors to be 6′ 6″ × 2′ 6″ × 1½ sed.med. Four panel doors hung to 1″ door linings with 3″ wrought butts, and fastened with 4″ rim latch. Back door, E.C. and Coals to be hung with X garnet hinges and fastened with Norfolk latch and locks or bolts.

"Construct stairs of ¾″ red deal risers and 1″ treads, housed to 1¼″ strings. Put proper 1″ shelving in space under stairs to form pantry.

"PLASTERER

"*Sand.*—To be clean and sharp and washed for fine plaster.

"The laths to be ordinary 'sawn' butted at joints and nailed with 1″ wrought-iron nails.

"The hair to be best long black hair well beaten and used in proper proportions.

"The lime to be well burnt chalk lime, run into putty at least ten days before using.

"Render and set all walls not otherwise described.

"Lath, plaster, float, and set all ceilings and soffits of windows and stud framing.

"Pave scullery, porch, E.C., pantry, and hearths with 1″ trowelled paving composed of one part of cement to two of sand.

"Put to all eaves 4″ cast iron half round guttering fixed to slight fall on wrought-iron brackets and 2½″ cast-iron round rain-water pipes to run into ground.

"Supply and fix all necessary iron straps for the external timber framing.

"GRATES

"24″-iron mantel registers in bedrooms and 30″ Belle portable range in kitchen.

"PLUMBER

"Put apron of 4 lb. lead under all upstairs window sills, roofs and cheeks of dormers to be in 4 lb. lead.

"GLAZIER

"The glass to be 15 oz. of a good quality, free from scratches and bubbles.

"The putty to be prepared from the best whiting and linseed oil. Leave all glass clean and perfect at completion.

£160 TO £180 COMPLETE

Wood and wire-wove. Living-room (12 ft. × 12 ft.), bedrooms (12 ft. × 10 ft. and 12 ft. × 8 ft.), kitchen (8 ft. × 8 ft.), and offices

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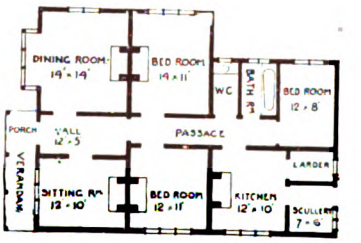


THE WOODEN BUNGALOW AT £380

(Rowell and Son, Westminster)

"PAINTER

"All woodwork to be painted three coats in oil, and concealed ironwork two coats of black.

"Black all stoves and range in Brunswick black, and touch up all painted work and leave all perfect at completion."

Every would-be owner of a bungalow must be indebted to Mr. Clough for his great kindness in providing the foregoing particulars. They are so complete that from them and the plans, which Mr. Clough has had drawn for us in his Estate Office, the reader can obtain all the information he needs, before proceeding, without anxiety, to set a builder to work.

VIII. A BUNGALOW WITH ELECTRIC BELLS FOR £210

The following interesting letter from Mr. Robert Messenger, architect and surveyor, of Herne Bay, is accompanied by a photograph of a cheap bungalow of what the reporters call "prepossessing appearance" (*see* page 183):

"HERNE BAY, KENT,
"*Nov.* 4, 1904.

"*To the Editor of* THE WORLD'S WORK AND PLAY

"DEAR SIR,—I have read your articles on cheap country cottages with great interest, more especially as Herne Bay, the town in which I live, is one of those seaside towns which are recognised as favourite summer and week-end haunts for Londoners. A great many families have small bungalows and cottages which are very little used except in the summer and for occasional visits.

"I have had a good deal of experience in building these small houses or bungalows, and I have come to the conclusion that, whether the by-laws enforce a brick building or not, it is very little, if any, more expensive to build in brick than it is in wood, and the advantages of the brick-built cottage are too numerous to be mentioned.

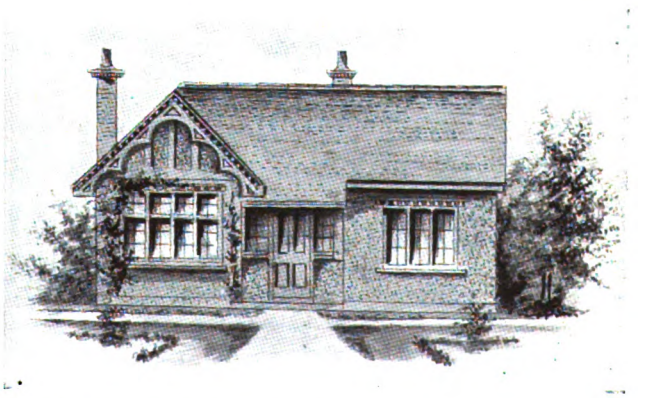
"The photograph shows a small week-end bungalow which I have had recently erected. The outside walls are nine inches place bricks, covered with cement rough cast. The inside walls are brick, 4½ inches thick. The accommodation is: a good sitting-room, kitchen, and three bedrooms. A water-closet is fitted complete. There is a cistern in roof, and water is laid on from the main; and a brick-built cesspool is provided forty feet from house, with ventilating shaft. The roof is covered with slates, and there is a wide verandah in front.

"The total cost of the building, including stoves, range, electric bells and all fittings, but exclusive of fencing, was £210—and I do not think that it would be possible to get a similar building carried out in timber framing and weather board for very much less. All rooms are nine feet high.

"Yours faithfully,
"ROBERT MESSENGER."

IX. "ROCK-BOTTOM PRICES"

There are no doubt cases in which it may seem hardly justifiable to touch even the smaller



BRICK AND ROUGH-CAST BUNGALOW WITH HALF AN ACRE FOR £350

On an estate in Kent, where Messrs. Rutter, of Norfolk Street, are building. Hall, sitting-room, kitchen, two bedrooms, bathroom, and W.C.

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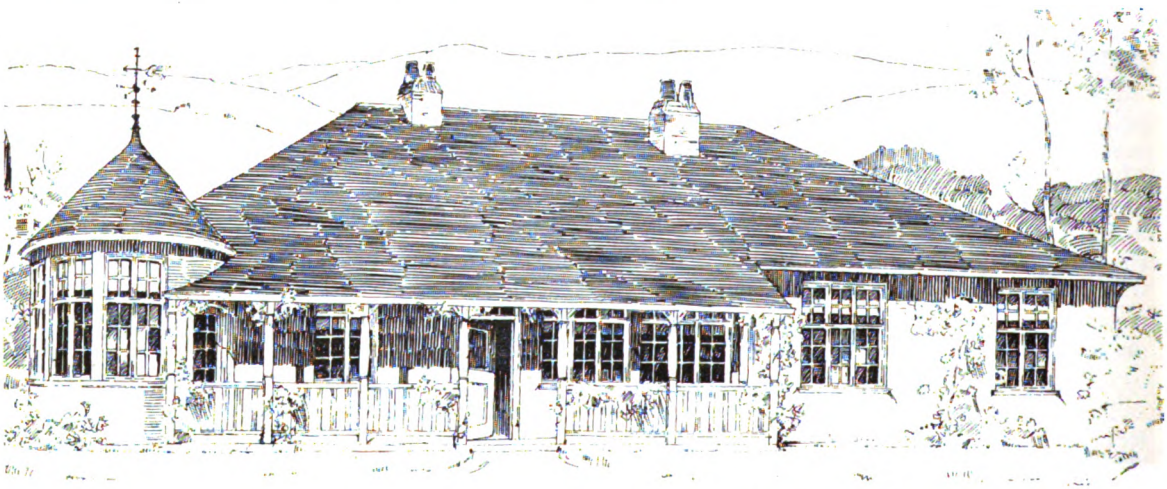
figures I have given for expenditure on cottages. I can only say that building must always run into a certain amount of money, and that "comfort" has always to be paid for. For those inclined to rough it, however—a would-be tenant of a cottage of mine described herself and her brother as "campers-in"—rough accommodation will of course serve. I once entered the "bungalow" of an artist, and found that his children's "bedsteads" were converted orange-boxes! Some people, too, in dealing with their ex-labourer's cottage, have planned permanent bunks—two deep—against the walls of the bedrooms. This is all very well in its way, but I don't know that it be renewed, and doors and windows, fire-grates, floors, and sanitary arrangements had to be "reformed altogether." Indeed, by the time the improvements were finished not much but the chimney-stack remained of the old cottage; and even now, changed as it is, I doubt if my friend could readily get his money back if he wanted to sell. I have myself a small old clay and stud cottage, now consisting of one big room—it is used as an out-house—and a friend wanted to spend money on making a "summer study" of it. Needless to say I dissuaded him, for by the time he was finished the structure would have been like the proverbial Irishman's stocking.



From "Bungalows and Cottage Residences" (Batsford)

AN INEXPENSIVE BUNGALOW BY MR. R. A. BRIGGS, IN SURREY

£400, with the bedroom shown at extreme right and another behind it, cut off. This leaves good-sized dining- and sitting-rooms, three bedrooms, kitchen, scullery, larder, and W.C.

is a healthy or cleanly arrangement, and I am afraid that during the winter the sleeping places would get a bit damp.

The fact is that it is very easy in pottering "economical" rearrangements, spread over a year or two, to spend as much as a thorough and well-considered overhaul all at once would have cost, and in the end to have a dwelling which fails to possess in its fitting-up those "elements of stability" which Lord Granville used to talk about. I have in mind as I write a "picturesque" four-roomed cottage which a neighbour bought for a hundred guineas, I think. It was prettily situated, and he thought he had a bargain. But every bit of the so-called plaster had to be taken off the walls and ceilings, and the clay of the rat- and mice-infested walls themselves and the rotten studs had to

I have not space to go into the matter as fully as I should like, but, personally, if I sought a really cheap week-end cottage I should certainly, instead of buying one of those dirty, tottering, damp-struck, broken-roofed, floorless old huts, which to the townsmen's eyes look so "picturesque"—outside—invest my money where I should get value for it, that is to say, in three old railway carriages! They would cost perhaps £10 apiece, and £10 to get them to the site of the intended retreat; and having stood weather and heavy jarring for years, the walls and roof of the proposed dwelling might be relied upon to be thoroughly sound. I should arrange the three in this shape ⊓ upon iron supports or concrete blocks, and when most of the compartment partitions had been removed, I should make one carriage the

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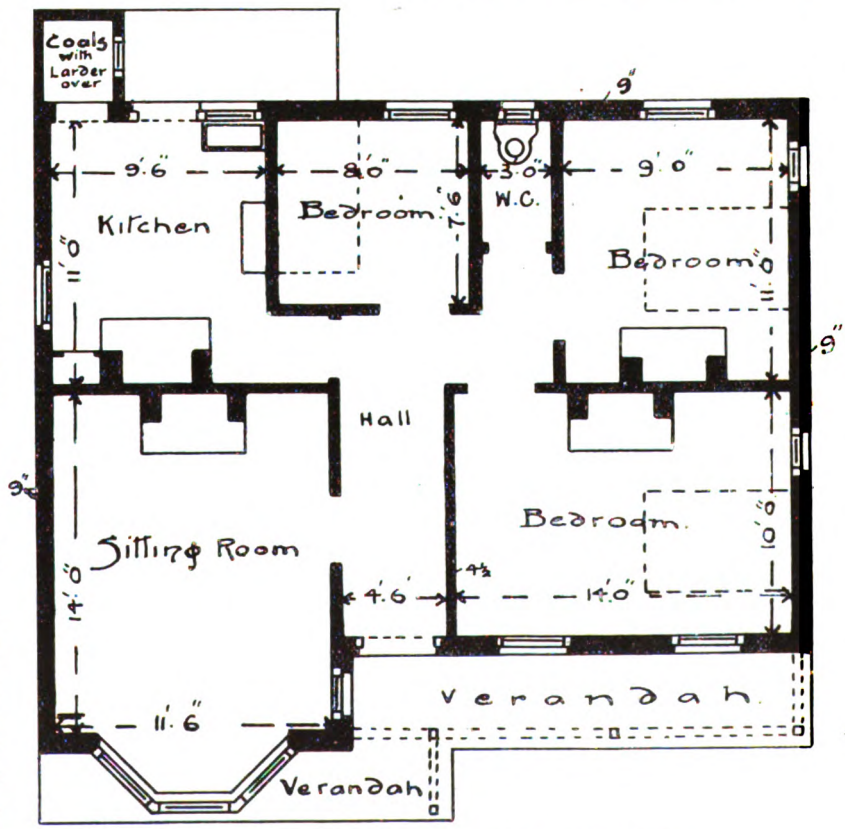
MR. MESSENGER'S £210 BUNGALOW

kitchen, scullery, &c., another the living-room, and the third the bedrooms. Further bedrooms would simply mean another carriage. Such a "bungalow" would be dry, light, and well-ventilated, holes for stove pipes would be already in existence in the roof, and judicious painting would soon remove a great deal of the railway-carriage look. Finally, when the "bungalow" came to be sold it would readily find a purchaser as a "bungalow" or as desirable workshops or hen-houses.

This is, perhaps, a suitable place to quote the simple plan for a cheap cottage bathroom given by Mr. H. W. Burton, an architect:

"A galvanised iron tank must be fixed in the roof above the bathroom, from which pipes must be taken to a tap over the sink, and to a large copper rose over the shower bath. A pump could be got for about £3, and will lift the water from the well to the tank, and every male bather would be called upon to do his share of pumping for the general use every



PLAN OF MR. MESSENGER'S £210 BUNGALOW

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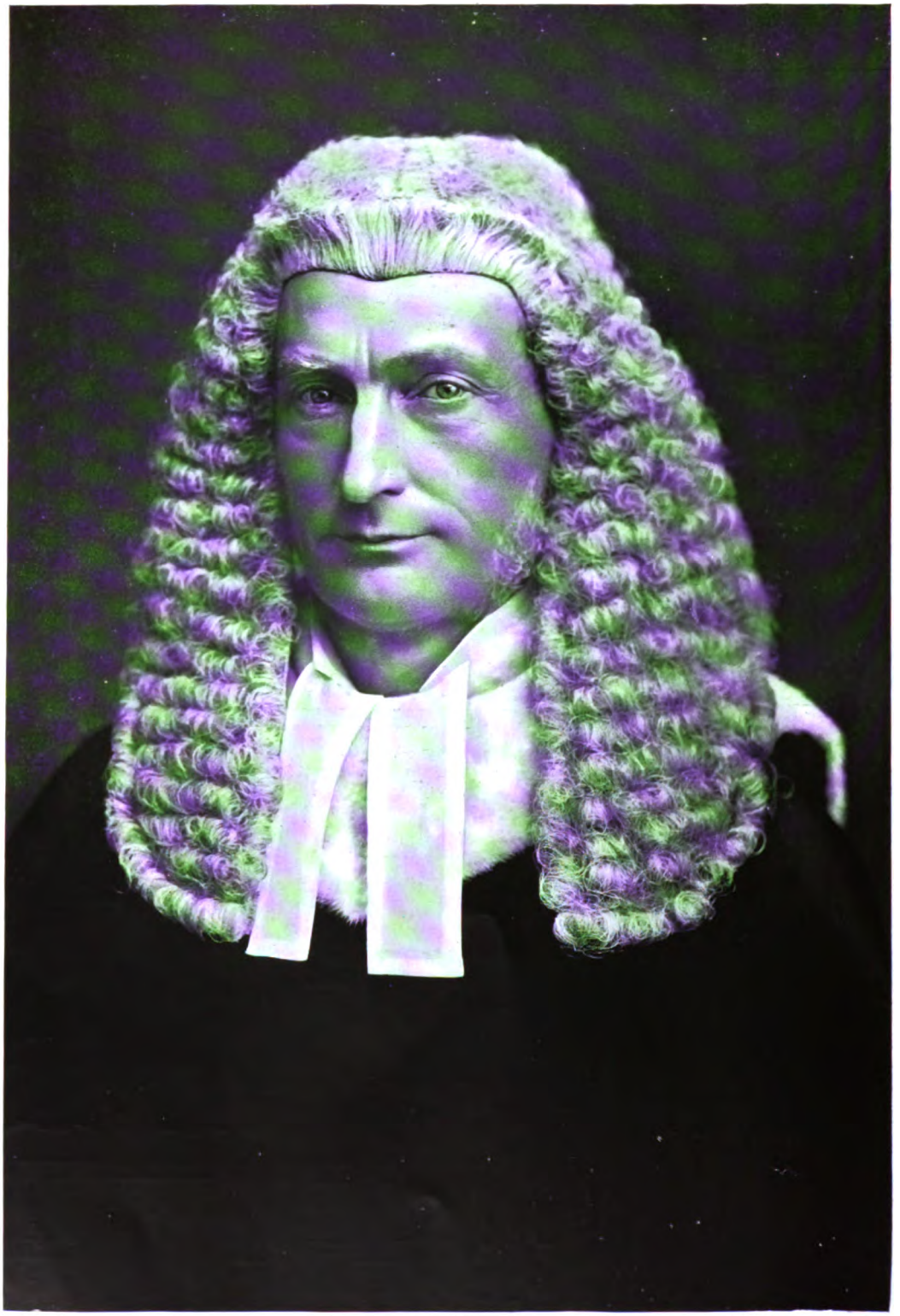

London Stereoscopic Co.

SIR WILLIAM GRANTHAM

THE WELL-KNOWN JUDGE WHOSE DISPUTE WITH A RURAL COUNCIL IN HIS CAPACITY AS LANDOWNER HAS PLACED HIM IN THE FOREFRONT OF THE AGITATION FOR CHEAPER COTTAGES

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day. The bathroom should be the place of ablution for all the inmates. Absence of washstands in bedrooms not only makes for increased floor space, but reduces housework. The floor of the space for "shower" is covered with zinc, with which also the walls are lined to a height of 2 ft. 6 in. Between the shower and the bathroom is a division 2 ft. 6 in. high, covered on side next shower with zinc. The opening above this should be closed with a canvas curtain, hung with rings on a rod, the bottom of it hanging just inside the division."

As Mr. Burton says, this is a most simple, inexpensive, and, at the same time, an all-sufficient bath.

By permission of the *Garden*] [W. J. James, Farnham Royal

AN ILLUSTRATION OF THE WAY IN WHICH THE APPEARANCE OF A BUILDING MAY BE TRANSFORMED BY CREEPERS

Clematis Montana and wistaria over the "Green Man" Inn at Farnham Royal, Slough

*** The next article in this series will be of great practical utility, and will deal with "One-Storey *v.* Two-Storey Cottages," "Building in Concrete—a material less used in this country than in America and on the Continent"—"Hints from American Experience," &c. It will be illustrated, as usual, with special plans and photographs.—EDITOR, THE WORLD'S WORK AND PLAY.

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ONE OF THE FIRST PROBLEMS AT THE DOGS' SCHOOL

After three tries the rat has been found

TRAINING DOGS TO CATCH RATS

A NOVEL INSTITUTION — DOGS SCIENTIFICALLY TRAINED — HOW PARIS IS EXTERMINATING ITS FOUR MILLION RATS

BY

A. PITCAIRN-KNOWLES

Illustrated from Photographs taken by the Author

IN these days when the whole world is at war with the apparently inexhaustible army of rats, and the most strenuous efforts are being made in every part of the globe to exterminate that insatiable rodent, it is hard to realise that there was a time when this pernicious animal actually rendered service, in the days when drains were unknown, and the roads were used as deposits for refuse. Then—from the hygienic point of view—the fortunate rats were considered to have a *raison d'être*; in fact they were regarded as a welcome means of improving public health, as they did by making their meals off the heaps of refuse, and thus assisting in purifying the atmosphere and furthering cleanliness. Nowadays, however, such considerate attentions of the omnivorous rat are little appreciated. Its bellicose attitude towards mankind, and the numerous dangers created by its troublesome presence, have excited the wrath of the human race, which has set its mind upon eradicating this much-dreaded foe, and will spare no efforts in trying to attain this object.

Some years ago, an old Paris rag-picker was actually eaten alive by rats. He was in the habit of drinking, and one day as he returned to his hut, more shaky than ever, the rats attacked him. Next day the body of the unfortunate victim was found in a terribly mutilated state, with the flesh torn from the bones and scattered all over the ground. Some broken pieces of furniture lying about and other signs showed that a desperate fight had taken place, but the rats had proved too strong and numerous for the infirm drunkard. Instances of young children and invalids succumbing to the bites of these blood-thirsty animals, who have been known to destroy the soles of elephants' feet, are by no means uncommon.

But not only is the rat the enemy of man inasmuch as it will assault him—its presence constitutes a graver danger, namely, that of spreading disease. It has been proved

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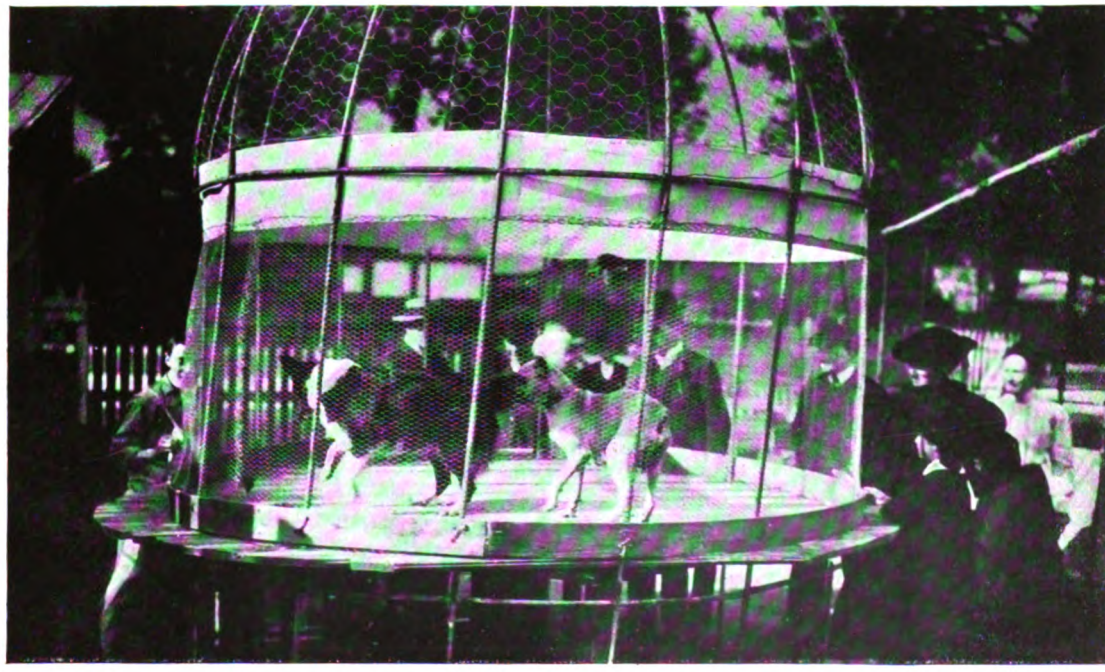
over and over again that epidemics with the most fatal consequences have originally arisen through the propagation of the disease by rats, which are supposed to communicate the germs to the fleas, these consequently contaminating the human being. Quite recently instances have shown with what ease and rapidity plague may thus be conveyed from one port to another, merely by a diseased rat entering a boat after passing along the ropes while the vessel is moored to the quay. The victim dies, its fleas contaminate other rats on the ship, and thus finally even the goods on board which convey the fleas, or may be the rats, to other ports bring disease with them.

ONE BY ONE THE DOGS ARE INITIATED INTO THE MYSTERIES OF RATTING

Many an elaborate scheme for a great war against the rats and their parasites has been suggested, but too little is being done to put an end to the terrible pest. In this respect we can learn a lesson from the Continent, where the dread of the ever-multiplying rodent is responsible for the foundation of quite a unique establish-



THE PROFESSOR AWAITS HIS PUPILS FROM ALL PARIS

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A HAPPY PARTY—FOR A TIME

The trainer shuts up an obstinate dog in this barrel in company with twenty rats. They continue friendly for a little while, but at length the dog becomes hungry and attacks the rats. Henceforth he is a rat-hater

ment, the "Ratodrome," or School of Rat-catchers, as we would call it. Paris, which—according to a recent estimate—has 4,000,000 rats within its walls, and boasts of a death-rate of 1,735,000 rats for the last year, is the birthplace of the original and practical "Ratodrome," where dogs are scientifically trained to chase and capture their voracious and agile long-tailed adversary. Within a stone's throw of some of the busiest and most aristocratic Boulevards, which do not even know of its existence nor require its services, this novel institution flourishes, and from all parts of the rat-haunted capital enthusiastic adherents flock to the school with its quaint arena and huge rat-cage, where "Monsieur le Professeur" awaits his pupils, whatever breed they may represent—poodles, fox-terriers, borzois, greyhounds, pointers, pugs, or bulldogs. It is all the same to him; sooner or later they will all acquire the useful art of despatching their fur-coated antagonists, and thus assist in freeing Paris of its millions of undesirable rat-tenants.

That the training of all dogs is not equally easy goes without saying. The fox-terrier, for instance, whose natural instinct makes him

TEACHING THE YOUNG IDEA HOW TO RAT

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IMPRISONING A RAT FOR THE DOG TO DISCOVER

revel in his work, is quickly taught, but imagine a domesticated poodle, who has enjoyed a life of luxury in his mistress' cosy boudoir, being suddenly confronted with a horde of furious rats! Indeed, it requires some patience to induce such spoilt pets, who have not the slightest natural desire to oppose a rat, to take pleasure in their new vocation. But herein the experienced and painstaking "Professeur Entraineur" excels.

One by one, or sometimes two or three at a time, he takes his pupils out of their kennels, leads them into the arena, and proceeds to initiate them into the mysteries of ratting. First of all the novice is set the simple task of making war against a rat visible to him from the very beginning of the chase. Thus started in his A B C he is taught to ascertain the hiding-place of his antagonist, and for this purpose the latter is shut up in a cigar-box, concealed under a flower-pot or thrust into a bundle of straw. It is amazing to see how quickly a well-trained ratter will, by the aid of his teeth and claws, force open a tightly closed box imprisoning the victim. When these more difficult problems have been thoroughly mastered, the canine warrior is driven into an underground passage where he encounters his foe, who has been previously placed therein, and a fierce battle in the dark ensues, resulting, as a rule, in the victory of the dog.

But it must not be supposed that the latter always gets the best of the tussle; indeed, many a time does the desperate rat get its teeth so firmly impressed into the flesh of its pursuer, that even the pluckiest terrier will beat a hasty retreat with his tail between his legs and whining dolefully, while the rat hangs on, but nevertheless prepared to renew the battle as soon as the kind trainer's hands have freed him from his pertinacious aggressor, and soothed the pain by means of a thorough antiseptic washing in the "hospital," where such wounds are promptly attended to.

Two or three weeks are, as a rule, considered sufficient to instil the required knowledge—in the case of a fairly intelligent animal. At the end of this course the proud owner returns to take the now accomplished ratter back into his charge, and the successful trainer pockets a "louis" (16*s.* 6*d.*) for his services. But sometimes very obstinate customers have to be dealt with, and for these a radical "cure" had to be invented. A barrel, open at one end and covered with wire netting, is used for this purpose. Twenty or thirty hungry rats are placed therein, and the incorrigible dog, who insists on remaining on so friendly a footing with the rats he is supposed to slaughter, is invited to join the happy party. At first the good feeling between dog and rat remains undisturbed, both parties apparently enjoying each other's company as much as ever, but as the time goes on, and hunger increases, restlessness begins to cause a general discomfort. At last the dog's angelic temper gives way to anger, feelings of hatred take the place of peaceful thoughts, and doggy finally declares war against his lively companions. The trainer's

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object is attained, for henceforth his obstinate pupil is sure to take his profession seriously—he has at last become a rat-hater.

No doubt many who witness these battles between the dog and the rat, or read this description of the doings at the Paris "Ratodrome," will express their disapproval of the nothing gives a greater proof of the absence of cruel treatment than the fact that not as much as a touch of the whip is required to make the dogs obey their instructor's orders.

Ratting, once upon a time, flourished in Great Britain, in those days when it was pursued as a popular amusement. Nowadays,

AFTER THE FIGHT—AN ANTISEPTIC WASHING FOR THE INJURED DOG

methods employed in the training, but let all those who have not had the opportunity of convincing themselves of the fact, be assured that no act of cruelty or harsh treatment on the part of the trainer towards the dogs has ever been detected, much to the dissatisfaction of a number of "prevention of cruelty" enthusiasts, who do not seem to be able to realise that every drop of dog's blood shed in the arena of the "Ratodrome" may mean the saving of many a human life. Perhaps however, it is no longer tolerated for such purposes, although, behind the scenes, it is still carried on. As a business it is upheld by the rat-catchers, who help to relieve the world of countless rodents. The French methods, practical and effectual as they are, will probably never find favour in England, but across the Channel the day may not be far off when every up-to-date "bow-wow" will be assisting in making the larger species of the rodent genus *Mus* extinct.

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GENERAL ANATOLE MICHAELOVITCH STOESSEL

THE HERCIC DEFENDER OF PORT ARTHUR

[See "The March of Events"

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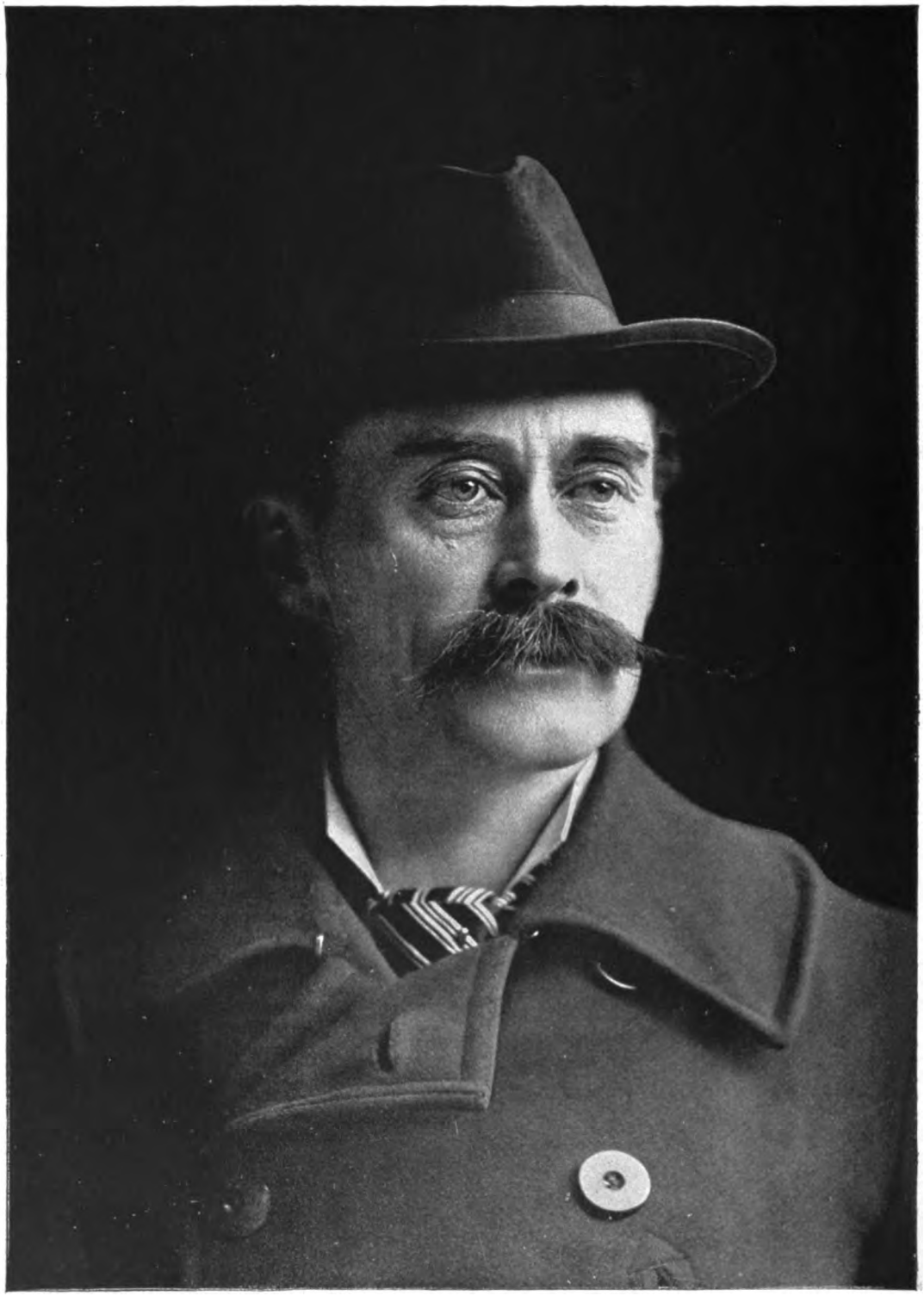

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LIEUTENANT ROBERT E. PEARY

PRESIDENT OF THE INTERNATIONAL GEOGRAPHIC CONGRESS,
WHO WILL MAKE ANOTHER NORTH POLAR EXPEDITION

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ANOTHER TRY FOR THE NORTH POLE

COMMANDER PEARY'S PLANS FOR AN EXPEDITION THIS YEAR—HIS VESSEL, CREW, AND ROUTE

THE unwearied search for the North Pole is to be resumed this year by Commander Robert E. Peary, of the United States Navy. His long experience in Arctic exploration is now being brought to bear upon the task of building a worthy vessel for the attempt. "The ablest ship that ever pointed her nose inside the Arctic or the Antarctic Circle," as he confidently describes it, is being constructed at Verona, Maine, in the yard of Messrs. McKay and Dix. An illustrated description of it appeared in a recent number of the *Engineer*, from which the following particulars are taken. The new ship will be essentially novel in a number of particulars, and to make her strong enough to pound away at the ice for months at a time, she will be fashioned and strengthened in unusual ways. Her principal dimensions are as follows:

Length on load water-line (between perpendiculars)	161 ft.
Length over all, from tip to tip of rail	181 ft.
Breadth, extreme, over guard	34 ft. 2 in.
Depth, moulded	20 ft.
Mean draught	16 ft.
Full load displacement, about	1500 tons.

The stem, the keel, the stern-post, and the frames are all of Virginia white oak, and made very heavy. The body form is so designed that pressure on the bottom and bilges will raise the vessel, and to provide the peculiar strength necessary to assist in this work, heavy diagonal braces of yellow pins are worked on each frame under each beam, and very securely anchored and bolted. The vessel has a number of water-tight bulkheads, all of them stoutly built, which, apart from adding to her structural strength, provide against the accidental admission of water. She will be ceiled inside. The hull is further strengthened by diagonal straps of steel plating, worked from bow to stern over the frames and on the main-deck beams.

To safeguard the bow, the stern, and the water-line from the grinding rub of the heavy ice, the outside planking will be greatly reinforced by steel plating. There will be two deck-houses. That aft will contain the galley, wash-room, and accommodation for some of the machinists. The forward deck-house will provide quarters for Commander Peary, the scientific staff, and the ship's officers. The interior finish will be very plain, but thoroughly comfortable and weather-proof. This house will be portable, and will be taken ashore for a storehouse and quarters after the ship has gone as far north as it is possible to force her. The crew will be quartered between decks, and the total complement, exclusive of Esquimaux, will not exceed forty persons.

The ship will be driven by a single inverted compound engine, capable of normally developing 1200 indicated horse-power, and under forced draught, some 1400 indicated horse-power. She will have one 10-ft. screw, which will be so arranged that it can be disconnected from the shafting, and housed in a well, out of the way of ice, &c. Steam will be supplied by two water-tube boilers. The craft will be heated by steam, and lighted both by electricity and oil. The rig of the vessel is unusual, so far as its spread of canvas is concerned, but one that is susceptible of easy-handling. The spread will be sufficient to make the vessel thoroughly manageable under sail alone. The foremast and mizzenmast are single sticks. All the standing rigging will be of the best galvanised steel wire rope, and very strong.

Commander Peary believes the Smith Sound route, yielding as it does a land base a hundred miles further north than is possible working from Franz Josef Land, is the most logica line of approach to the North Pole; it promises a firmer ice pack to traverse, and the possible chance of doing the work in one year. It has been declared by Commander Peary that the coast of Grant Land will be his objective, and his aim will be to force his ship as far north there as possible. At Whale Sound he will take on the pick of the Esquimaux. He says: "I shall go into winter quarters on the north shore of Grant Land and start with the earliest returning light on the sledge journey across the central polar pack, using the Esquimaux entirely for the rank and file of my party." He will leave the United States in June or July.

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PLYMOUTH AS A MAIL PORT

ITS GREAT ADVANTAGES HAVE LED MANY OCEAN LINES TO MAKE PLYMOUTH THEIR PORT OF CALL FOR THE LANDING OF MAILS AND PASSENGERS —THE ENTERPRISE OF THE GREAT WESTERN AND THEIR COMPETITORS THE SOUTH WESTERN—SOME ASTONISHING RAILWAY SPEEDS—WILL THE POST OFFICE ALSO ADOPT PLYMOUTH FOR THE EMBARKATION OF MAILS?

BY

H. G. ARCHER

THE position of Plymouth at the entrance of the English Channel confers on it an unrivalled advantage as both an outgoing and homeward port of call for the embarkation and debarkation respectively of ocean mails and passengers. The port is accessible at all stages of the tide and in all conditions of weather; and in its splendid harbour, which is sufficient in expanse to shelter all the navies of the world, the presence of the largest ocean liner afloat is no more noticeable than that of a duck in a duck-pond. And although this vast harbour is so securely landlocked that anchorage within it spells security itself, yet there is the world-famous breakwater, just a mile in length, inside which the ocean leviathans can anchor, furnishing a second and still stronger line of defence. The position of the port is so well marked both by day and night, by the Eddystone Lighthouse on the outh, and by the Lizard Lights on the west, that no mariner need ever be at fault in making it. Plymouth is so near the direct route of all vessels coming up the Channel, whether bound for the Continent or home ports, that very little time is lost in putting-in to land mails and passengers. And during the summer months at least, putting-in at Plymouth does not necessitate coming inside the breakwater, for then the ocean steamers may lie outside, either dropping anchor there, or, as more frequently happens, merely slowing down whilst the tenders cling limpetwise to their hull, and the work of transferring the mails and passengers is carried out. In winter, however, the friendly shelter of the great breakwater is usually sought. By calling at Plymouth, homeward bound vessels are rendered entirely independent of tide and weather for landing mails and passengers, while both of these reap the advantage of avoiding the delays of the Channel passage in stormy or foggy weather. Then, in the outward direction, it would only take vessels very little out of their way to interpolate a call at Plymouth, inasmuch as it is understood that for navigating purposes vessels bound southwards down the Channel make a point of sighting Start Point (which is about fourteen miles east from Plymouth as the crow flies), so as to be in a better position to take a course well clear of the north-west coast of France.

Therefore, considering the foregoing advantages, it is not surprising that so many Ocean Lines should now be making Plymouth their port of call for the landing of mails and passengers from North and South America, the West Indies, New Zealand, Australia, India, and the South and West Coasts of Africa. During the year 1903 no fewer than 509 ocean vessels called here to debark and embark mails, passengers, and specie, the following lines being represented:

Name of Company.	Trading between	Whether calling on Outward or Homeward voyage.
P. and O. S.N. Co.	London and Australia	Homewards.
	,, ,, Bombay	Homewards.
	,, ,, Calcutta	Homewards.
American Line* .	New York and Southampton	Homewards.
British India S.N. Co.	London and Calcutta	Homewards.
	,, ,, Brisbane	Homewards.
Orient Pacific S.N. Co.	London and Australia	Both.
Aberdeen Line .	London and Australia	Both.
New Zealand S.N. Co.	London and New Zealand	Both.
Shaw, Savill and Albion Co.	London and New Zealand	Both.

* Since April 1904.

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Name of Company.	Trading between	Whether calling on Outward or Homeward voyage.
Union Castle Mail Packet Co.*	London and Cape Town	Homewards.
Royal Mail Steam Packet Co.	Southampton and West Indies	Homewards.
British and African S.P. Co.	Liverpool and West Coast of Africa	Homewards.
African S.S. Co.	Liverpool and West Coast of Africa	Homewards.
White Star Line .	Liverpool and Australia	Homewards.
Hamburg American Co.	Hamburg and New York	Both.
North German Lloyd	Bremen and New York	Homewards.
British and Colonial	London and Cape Town	Homewards.

* Intermediate steamers.

Let us now consider the dock accommodation at Plymouth—excluding the Government dockyards at Devonport and Keyham which do not come within our province. The Plymouth Great Western Millbay docks, which are situated within half a mile of the Millbay passenger terminus, were originally constructed by a local company from designs of the late Mr. Isambard Brunel in 1857. In 1874 they became the property of the Great Western Railway Company, who have since spent considerable sums of money in improving them. The following table shows the extent of the Great Western docks, and the accommodation they afford.

Floating Basin—

Water area	13 acres.
Length of dock	1200 ft.
Width of dock	450 ft.
Length of quayage	2640 ft.
Width of entrance	80 ft.
Depth of water at ordinary spring tides	22 ft.
Depth of water at neap tides	18 ft.

Outer Harbour—

Water area	35 acres.
Length of quayage	3380 ft.
Depth of water at ordinary spring tides	12 to 40 ft.
Depth of water at neap tides	8 to 36 ft.

West Wharf—

Length	800 ft.
Depth of water alongside at low water ordinary spring tides	24 ft.

Floating Pontoon (Trinity) Pier—

Extreme length	300 ft.
Extreme breadth	40 ft.
Depth of water alongside at low water ordinary spring tides	18 to 21 ft.

Graving Dock—

Extreme length	464 ft.
Breadth at entrance	80 ft.
Height of sill above bottom of dock	2 ft.
Depth of water over blocks at ordinary high water spring tides	22 ft.

The Company have recently completed a new entrance to the Floating Basin, fitted with double gates, eighty feet in width, which are worked by hydraulic machinery of the latest and most improved pattern. Further, the Outer Basin has been deepened, and the Trinity Pier widened and lengthened to accommodate the Continental and coasting traffic. Capacious sheds and warehouses are provided contiguous to the wharves, capable in their present state of storing about 150,000 tons of goods, and considerable additions are now being made to both the wharf and warehouse accommodation. Nearly five miles of railway lines are laid around the quays. A railway station has been erected in the Docks for ocean passengers, and the mail and passenger special trains start thither and arrive hither. The Great Western Railway Company have a small fleet of steam tenders for attendance on the ocean mail steamers. Two of these, the *Sir Richard Grenville* and the *Smeaton*, are twin screws, and each is licensed to carry 800 passengers, for when not required as tenders, both make pleasure cruises round the beautiful harbour and up the river Tamar.

It should be added that although the Great Western Railway Company do not undertake repairs, there are several engineering, shipbuilding, and repairing firms conveniently situated in the proximity of the Millbay Docks.

The history of the Plymouth ocean mail and passenger traffic may be said to date from the year 1853, when the then newly formed Union Line first availed itself of the port. Prior to this, the only mail steamers calling there were those of the African Company trading between Liverpool and South Africa. The example set by the Union Line was soon followed by the General Screw Steam Shipping Company, founded in 1852, to carry mails by the long sea route *viâ* the Cape to India, and the Australian Auxiliary Steam Clipper Company, formed in

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1856 to trade between London and Australia. In 1867 the Falmouth and Plymouth Chambers of Commerce combined with a view to impressing the Post Office with the advantages to be afforded to the merchants in the Midlands and North of England, Ireland, and Scotland—and the Severn Tunnel was undreamt of at that period—by the landing of the West India mails at a western port, through their letters reaching them almost as soon as in London, an advantage not to be attained by the landing of the mails at Southampton. The matter was carefully investigated, and the inquiry produced the desired result, for in October of the same year the first homeward West Indian mails were landed at Plymouth from the *Tasmanian*, a small tug being engaged for the purpose by the Royal Mail Steam Packet Company. From the commencement, the mail contract was held by the Great Western Railway Company. Until comparatively recently, the Great Western was the only railway serving Plymouth. It was not till 1890 that the London and South Western Railway Company obtained independent access to Plymouth (with a route *viâ* Okehampton, Lydford, and Tavistock, actually sixteen miles shorter than that of the Great Western), when, of course, the newcomers promptly set about establishing quay accommodation there, namely, at Stonehouse Pool, in direct railway connection with their main line at Devonport and Stonehouse.* Notwithstanding the fact of having the shorter route, however, the London and South Western made no attempt to compete with the Great Western for the ocean mail and passenger traffic as between London and Plymouth. In the first place, the circumstance of the debarking and embarking place for the mails and passengers being the property of and alongside the lines of the Great Western gave this Company the pre-eminence with regard to the London express passenger and goods traffic to and from Plymouth; secondly, the mail contract was still held by the Great Western Company; and thirdly, the South Western Company were deeply interested in the development of their new acquisition, the port of Southampton, the principal Channel port. Consequently, the South Western Company contented themselves with exploiting the route for the benefit of those passengers whose destinations lay anywhere on the south-west or south coasts. Meanwhile, their quays at Stonehouse soon came to do a very considerable business in the goods, fish, and cattle traffic, for which they were conveniently situated.

As invariably happens when two enterprising British railway companies make for the same objective, the advent of the South Western Company was attended by an all-round improvement in the Plymouth train services. As between the metropolis and Plymouth, the journey by each route, from being of 6½ hours duration, was gradually accelerated to take less than 5 hours. For example, the time-tables of last summer showed that the Great Western ran between Paddington and Plymouth (North Road), 246 miles, without a stop, in 4 hrs. 25 min., thus establishing a fresh world's record as regards length of non-stop journey. Further, they gave twenty-one express trains daily between London and Plymouth, the duration of the journey by all averaging 5 hrs. 44 mins. The South Western gave eleven trains between Waterloo and Devonport, the duration of the journey by all averaging 5 hrs. 32 mins.

Consequent upon the intimation from the Post Office that on and after Saturday, April 9, 1904, the homeward-bound mail vessels of the American Line must call at Plymouth to debark the mails, instead of voyaging on to their terminal port, Southampton, the dormant claims of Plymouth as a port of call were once again revived, and this time in startling fashion. Ever since its creation from out of the old-established Inman Line, and removal from Liverpool to Southampton, the American Line traffic had been one of the cherished "ewe lambs" of the South Western Railway Company. The latter realised the truth of the saying that "passengers follow the mails," and therefore they decided to make a bold bid to attract the homeward-bound passengers to their own route instead of leaving them to take that of their rivals, who were bound to carry the mails. Two things, however, were necessary to put their resolve into execution, namely, a proper landing-place at Stonehouse Pool and a comfortable tender. These wants were speedily supplied. On the quays at Stonehouse a commodious pier railway station, well-equipped with waiting- and refreshment-rooms, together with a Customs House, telegraph and telephone offices, and

* The Great Western Company will soon have a new route to the west, five miles shorter than that of the South Western to Plymouth. This direct route will be brought into existence by the completion of the Castle Cary and Langport line, when the West of England express trains will travel *viâ* Newbury, Westbury, Castle Cary, and Langport, and rejoin the existing main line at Taunton. The saving of distance will be twenty-one miles to Taunton and all stations beyond.

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steam cranes for the transfer of baggage, was erected; and a fine twin screw steamer, the *Victoria*, an ocean liner in miniature, was withdrawn from the Southampton-St.Malo service to act as tender. Further, a splendidly appointed corridor train, comprising a combined restaurant and kitchen car, was specially built to await the arrival of the tender, directly in line with the point of debarkation, and, when the Customs House formalities had been gone through, to convey the passengers up to town within 4¼ hours.

Directly the Great Western authorities learned that the South Western Company intended accomplishing the journey to London in such short time, they prepared to carry the mails from off the same vessels thither in shorter time, and they were perfectly justified in their resolve. If the Post Office found that the South Western Company could run to London in less time than the present possessors of the Mail Contract, the fact would be taken into consideration when the time came for the renewal of the contract. But in inaugurating the succession of extraordinarily rapid mail special trains to London, the Great Western Company were actuated by far broader motives than that with which common report associates them, namely, of racing against the South-Western passenger specials from off the American Line vessels. The Great Western Company seized the opportunity to urge the claims of Plymouth as a port of call in no uncertain fashion, namely, by accelerating to a common standard of excellence every mail train from off every ocean steamship calling there to debark mails and specie, in order to prove the superiority of Plymouth as a mail port to Southampton, Queenstown, Dover, and even Liverpool. It has now been rendered possible for mails landed up to noon to be delivered in London the same afternoon, while mails for the Midlands and the North reach their destination the same evening, and those for the north of Scotland early the next morning. This is the true purport of the superb speed performances on the Great Western route, which have astonished the world. On April 9, when the *St. Louis* first called at Plymouth, the Great Western mail special, with 1148 bags of mail, left the Millbay Docks at 4.59 A.M. and arrived at Paddington at 9.17 A.M. Two halts were made *en route*—at Exeter 3½ minutes, and Bristol 8½ minutes. The run of 246¾ miles was thus covered in 258 minutes, including stops. The South Western boat special, whose passengers have a longer voyage on the tender, and must undergo the Customs examination, left Stonehouse Pool at 5.3 A.M., and accomplished the journey to Waterloo, 230 miles in length, in 271½ minutes. inclusive of four stops consuming a total of 16½ minutes. Since their initial performances, both companies have done far better, the Great Western having accomplished the journey in 4 hrs. 13 mins., 4 hrs. 12 mins., 4 hrs., 3 hrs. 56 mins., 3 hrs. 54 mins., and 3 hrs. 46 mins.; and the London and South-Western in 4 hrs. 3 mins., and 4 hrs. The Great Western record run was performed on Monday, May 9, with the mails from off the North German Lloyd liner *Kronprinz Wilhelm*, which had crossed from New York to Plymouth in 5 days, 16 hrs., 8 mins. The mails were delivered in London in the record time of 5 days, 21 hrs., 58 mins. from the time of their departure from New York. The train consisted of four eight-wheeled mail vans, weighing 22 tons each, and one eight-wheeled sorting-van, weighing 25 tons. The mails and specie weighed 35 tons. The sorting-van contained the mails for the Midlands and the North, and was detached at Bristol. Therefore, the total weight behind tender was 148 tons as far as Bristol, and about 115 tons for the remainder of the journey. After this display of fireworks the company decided that the schedule of their mail special trains should be fixed at 4¼ hours, inclusive of a stop at Bristol to detach the northern portion of the mail consignment. They have recently built some new "Ocean Mail" vans for the conveyance of the foreign mails between Plymouth and London—fine vans measuring sixty-eight feet in length, with an extreme width of nine feet six inches, and a storage capacity of 4610 cubic feet. They have three sliding doors at each side, and sliding doors and collapsible gangways at the ends. The bodies are placed upon underframes of rolled steel, the whole being mounted on four-wheeled bogies of the latest type.

The London and South Western Company achieved their record run in four hours on Saturday, April 30, when their tender transferred 40 passengers and a large amount of baggage in 16 minutes. As they have not the track-water troughs, the South Western Company are precluded from emulating the Great Western feat of running from Plymouth to London without stop, so they arrange to halt once, at Templecombe, 118½ miles from Waterloo, to change engines. Between Plymouth and Exeter both routes are terribly severe, but the Great Western is the severer. Banks of 1 in 40 (the Hermerdon bank is 2½ miles of 1 in 40), alternating with sharp curves, abound. The Great Western

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Company seldom runs a passenger special in connection with the arrival of an American Line boat. That steamship company indulges in the protectionist policy of refusing to allow luggage to be debarked on the Great Western mail tender, and at first also they even prevented passengers from so debarking. This high-handed action of theirs may be in accordance with American traditions, but it is entirely contrary to the British rule of fair play for all.

The Great Western Company are always prepared to run a passenger special to London if a sufficient number of passengers land from a North German Lloyd boat. These special trains, with a restaurant car attached, perform the journey in from 4¼ to 4½ hours.

In conclusion, it remains a matter for some surprise that the Post Office have not yet adopted Plymouth for the embarkation of mails. We have already shown how it would take the vessels very little out of their way to make a call there, and with the splendid fast train service now given by the Great Western Railway Company it is clear that letters mailed in London up to midnight, and in the Midlands and North till late in the evening, would reach Plymouth in time for despatch by an ocean liner early on the following morning, which would represent a gain of nearly a whole day to the commercial correspondence of this country. Further, a similar amount of time would be saved by passengers if the outgoing vessels called at Plymouth, where the company make special arrangements for the embarkation of passengers. It only occupies three-quarters of an hour from the arrival of a train at the Docks to make the transfer to a vessel lying in the Sound.

THE STORY OF THE CHRISTMAS CARD

A NATIONAL INSTITUTION WHOSE SMALL BEGINNING OCCURRED SIXTY YEARS AGO WHEN A YOUNG MAN SENT A FESTIVE SKETCH TO A FRIEND—HOW THE IDEA WAS TAKEN UP COMMERCIALLY—TENNYSON'S REFUSAL OF £1000—THE BRITISH INDUSTRY AND ITS WORKERS—CARDS FOR THE BLIND

BY

PERCY COLLINS

WHEN we realise that for several seasons past something like 35,000,000 Christmas cards have been transmitted annually through the British Post Office alone, the fact that the production of Christmas cards forms no inconsiderable item in the world's work is self evident. Of all the national institutions with which we are accustomed to celebrate the festive season, the card of kindly greeting can boast of having had the smallest beginning and the most steady growth. Not a few among us can look back at the time when Christmas brought no cards; for, as far as can be ascertained, the first genuine Christmas card was not entrusted to the care of the Post Office until the year 1844 or thereabouts. The sender of this solitary token of goodwill was the late W. A. Dobson, R.A., whose *Charities of Dorcas*, *Christ Child's Journey to Nazareth*, and other much copied religious canvases will be familiar to many readers. But at the time of which we write Mr. Dobson was just a very young man earning his living as a master of the Government School of Design at Birmingham, and in sending the first Christmas card he certainly had no idea that he was laying the foundation-stone of what was destined to become a national institution. He had a friend from whom he had received certain courtesies of which he desired to show his especial appreciation. The time was Christmas. So after some thought, he made a sketch symbolising the spirit of the festive season and posted it to his friend. This sketch—the first Christmas card of which any record is preserved—was done on a piece of Bristol board about twice the size of the modern letter-card. It depicted a family group toasting absent friends among appropriate surroundings of holly and evergreens, and was supported by panels illustrating deeds of benevolence.

The unpretentious little picture gave so much pleasure to its recipient and was the cause

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of so much envious interest among his friends, that Mr. Dobson was prevailed upon to repeat his experiment. Then, two years later, he etched another design, had a block made by a local lithographer, and posted copies to all his friends.

A really happy inspiration does not long remain the exclusive property of the inspired. The next year, several of Mr. Dobson's artistic acquaintances were producing their own Christmas cards and sending them to their own friends; and with each succeeding season this circle of imitators grew wider. Ten years or so later, some one suddenly saw money in the notion, and thus the Christmas card of commerce was put upon the market.

Compared with their modern representatives, these early efforts were astonishingly crude both in design and in colouring. Impossible robins, impossible flowers and equally impossible snowed-up churches—such subjects seem to have constituted the limitations of the Christmas card artists of the fifties and sixties. Indeed, when, in turning over the contents of some long-locked drawer or box, one comes across specimens referable to this period, one marvels much that purchasers could be found for such sorry productions.

But time and taste were working. During the seventies a decided improvement was apparent. The cards now began to show a greater variety in design and were the product of far better workmanship. Indeed, it is said that in richness of humour one or two of the cards of this decade have never since been surpassed. Yet it was not until the firm of Raphael Tuck turned its attention seriously to the matter that the Christmas card became both an artistic and a commercial success. Messrs. Tuck began to publish cards as long ago as 1866. At first they do not seem to have realised the gigantic proportion to which the trade in these dainty trifles was destined to grow. Twenty sets of cards—three designs going to a set—represented the output of their first year. Next year the twenty sets had grown to thirty; the following year the thirty had become fifty—and so on. Thus, there was a reasonably steady growth apparent from the very first. Yet it was not until some fourteen years later—in 1880 to be exact—that the firm became sufficiently impressed by the public demand for high-class cards to take the unprecedented step of offering valuable money prizes for competition among designers. It was then, and not till then, that the era of the really artistic Christmas card began.

At this period, open competitions of this kind were anything but everyday occurrences, and there was an eager rush for a share in the five hundred guineas offered in prizes. Among those to engage in it were George Chausen, F. E. Wetherbee, Rebecca Coleman and many others whose names have since become well known in the art world. The warmest interest was evinced in the enterprise by Millais, who is said to have voiced the opinion that the cult of the artistic Christmas card would do more to engender a sense of beauty among the masses than the Royal Academy itself. He, in company with Stacey Marks and Sir Coutts Lindsay, acted as judges in the competition. So gratifying were the results and so excellent was much of the work sent in that Messrs. Tuck actually expended a sum of £2500 in buying sketches that had just missed being prize winners.

From this time forward the universal popularity of the artistic Christmas card was assured, and its subsequent evolution was very rapid. About the year 1886, it was suggested that something might be done towards making the card itself—as distinct from the design—more attractive. Hitherto, all cards had been what are technically known as "single." The folded card now made its appearance and held sway for six or eight years. After this, for four or five years, the rage was for cards with edges of fringed silk. Finally, the "booklet" came upon the scene, and continues to rule the hearts of card buyers at the present day, when Messrs. Tuck alone produce annually no fewer than 1600 sets of designs, and when scores of wealthy firms, both at home and on the Continent, are actively engaged in planning and producing Christmas cards.

The reminiscences of the firm of Raphael Tuck are many and interesting. Sixteen or seventeen years ago they issued their famous "Royal Academy" series, every card in which was designed by an Academician. It was this scheme, by the way, that led to the discovery of the facts which have been related in the first paragraph of the present article. For, when asked to contribute to the series, Mr. Dobson—now an artist whose pictures had been purchased by Queen Victoria and other discriminating patrons of art—laughingly replied: "I ought to be the man for you since it was I who *invented* the Christmas card."

Then, too, the firm has some interesting facts to relate respecting the publication of its famous panel card in twenty-seven colours after the beauteous *Madonna Ansidei*, which had

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just been purchased from the Duke of Marlborough by the nation for £70,000. The reproduction of this masterpiece as a Christmas card was not originally undertaken as a commercial venture, but in order to prove the possibilities of artistic colour-printing. Yet so quick were the public to appreciate the value of what was placed before them that the undertaking was crowned with highly satisfactory results—and this notwithstanding the fact that the cost of producing the panel had run into four figures. Specimens were sent to the late Queen and to a number of her distinguished subjects; and on every side the picture won for itself the highest possible praise.

Having enlisted the sympathies of artistic circles in the welfare of the Christmas card, Messrs. Tuck turned their attention to the poets. They began by asking the bench of Bishops for contributions. It is interesting to note than the only one to decline did so on the grounds that he had never written a line of poetry in his life. Then Tennyson was offered £1000 if he would write one dozen eight-line verses suitable for Christmas greetings, to be printed on high-class cards. The great poet declined politely but decisively. He is reported to have said that although it might be possible for him to write a dozen verses on Christmastide which would be pleasing to the public, he was perfectly certain that he could not write as many as four verses on the one topic and please himself.

It is, of course, well known that an enormous number of Christmas cards for the English market are produced abroad. But it is gratifying to be told that much of the very best work of to-day is exclusively English. Messrs. Hills and Co., Limited, for instance, claim that the whole of their cards are designed by British artists and produced by British workpeople. A visit to their factory—where all the processes connected with the publication of Christmas cards can be studied in one building—is full of interest and instruction.

Most people, if called upon to give their opinion as to when the first steps towards the active production of Christmas cards are taken would probably answer: "A few months before they are needed by the public." But the visitor to the factory is very soon disabused of any such notion. As a matter of fact, the designs which our readers are admiring on Christmas morning, 1904, were prepared by the artists two, three, or even four years ago. The actual printing of the cards commences some fourteen or fifteen months prior to the Christmas for which they are intended. Thus, in inspecting the printing-rooms of a Christmas card publishing house early in October last, the writer was shown batches of finished cards which are to bear us good wishes on Christmas morning, 1905. This despatch is of course largely due to the Colonial trade, which commences early in January; but even the home travellers have to be on the road by the beginning of April. Thus it happens that the Christmas card publishers' really busy time—what is known as "the rush"—is from January to September. The remainder of the year is occupied in preparing for the next season's work and in coping with the rapidly growing demand for personal or private greeting cards.

No one who has not an actual knowledge of the facts can picture the enormous amount of labour involved in the production of even cheap cards. The greatest possible care, for instance, is exercised in the matter of colour. Tinted card and paper are specially prepared, silk ribbons are specially woven to match, and no precaution that good taste can suggest or scientific skill devise is neglected. This unremitting attention to detail is only made possible by the enormous annual output, which enables publishers to engage good artists and skilled workmen for even the cheapest productions. Many of the cards which are sold for one penny apiece have cost £10 or more for the design alone.

The most striking feature of the Christmas card trade to-day is the amazing variety of subject seen in the designs. There are cards calculated to appeal directly to all sorts and conditions of men and women. Sport and play, music and the drama, science and religion—these, and a hundred other ruling topics in the minds of men have each their attendant Christmas cards. There are cards for huntsmen and cards for bridge players, cards for shorthand-writers and cards for typists, cards for the old and cards for the young. Best of all, there are cards for the blind. And thereby hangs a tale.

Christmas cards for the blind owe their inception to the happy thought of a lady. She was engaged in sending out her greetings one season, when she was saddened by the sudden thought that it would be useless to send a card to a relative who, during the year, had lost her sight. Then it occurred to her that the blind are still capable of appreciating kind wishes through the touch, even though they may

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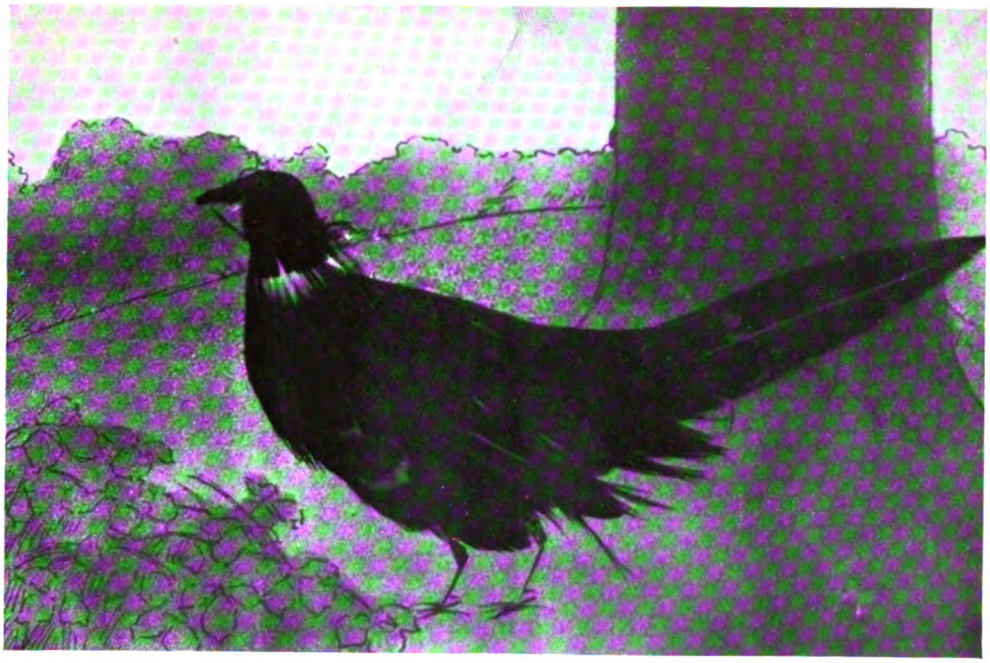

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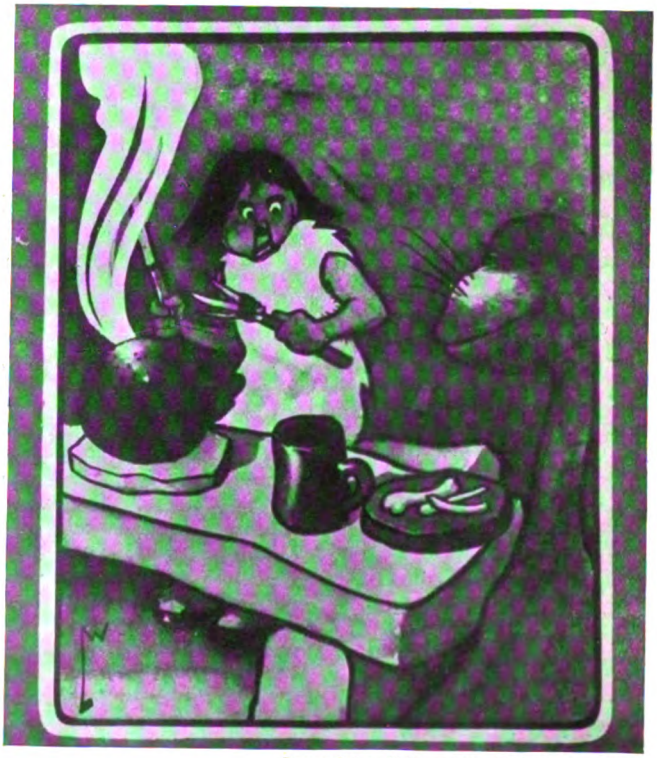
A QUAINT CARD: THE BIRD IS MODELLED WITH REAL FEATHERS

be unable to read them with the eyes. So she hunted through her packet of cards and eventually selected one which depicted an angel bearing a cross. This picture she cut out and mounted upon a card. Its recipient was able readily to appreciate both the meaning of the simple device and the kind thoughts of which it was the bearer.

News of these facts came to the ears of the Editor of the *Weekly Summary*—a newspaper published for the blind in that strange finger-read language known as Braille, and, in 1893, Christmas cards for the blind were first issued commercially. The beginnings were very simple. A picture from an ordinary Christmas card was cut out and mounted upon a card. This, in its turn, was stuck upon a piece of the special paper always used for embossed writing, and the words were then put upon this in Braille by hand.

This method of production was, of course, very laborious, and in two years the sale of the cards had increased to such an extent that the publishers felt justified in devising means for their production in quantity. To-



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"A PREHISTORIC CHRISTMAS"
"READY FOR THE SECOND COURSE"

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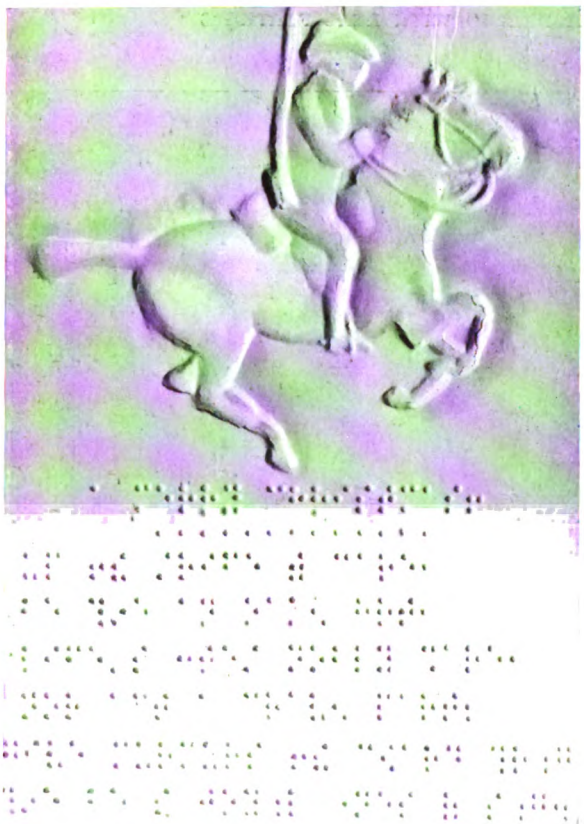
A STRIKING IMPERIAL CARD



A CHRISTMAS CARD FOR THE BLIND

day, the designs and words are printed on the cards by one process.

It is a noteworthy fact that the pictures which are to be realised by the finger tips are more pleasing to the young than to the old. Strange as it may seem, the designs actually convey a definite sensation of pleasure to the little ones whose fingers serve them for eyes. The delight of one little boy of eight, blind from birth, in a card with "a real horse that Johnny could ride" was as pretty as it was pathetic. The words on the cards are most carefully selected, and include Bible texts, verses from well-known hymns, and quotations from the classics. For the benefit of those who may wish to obtain these cards for blind friends it may be added that they are to be purchased at the *Weekly Summary* Office, Shere, Surrey.

Read by the finger tips, the following is the greeting which the original of the accompanying "Yeoman" card conveys to its blind recipients:

A MERRY CHRISTMAS

"Up to the strife with care
Be thine an oaken heart,
Life's contest nobly share,
Nor act a craven part,
Give murmurs to the coward throng
Thine be the joyous notes of song."

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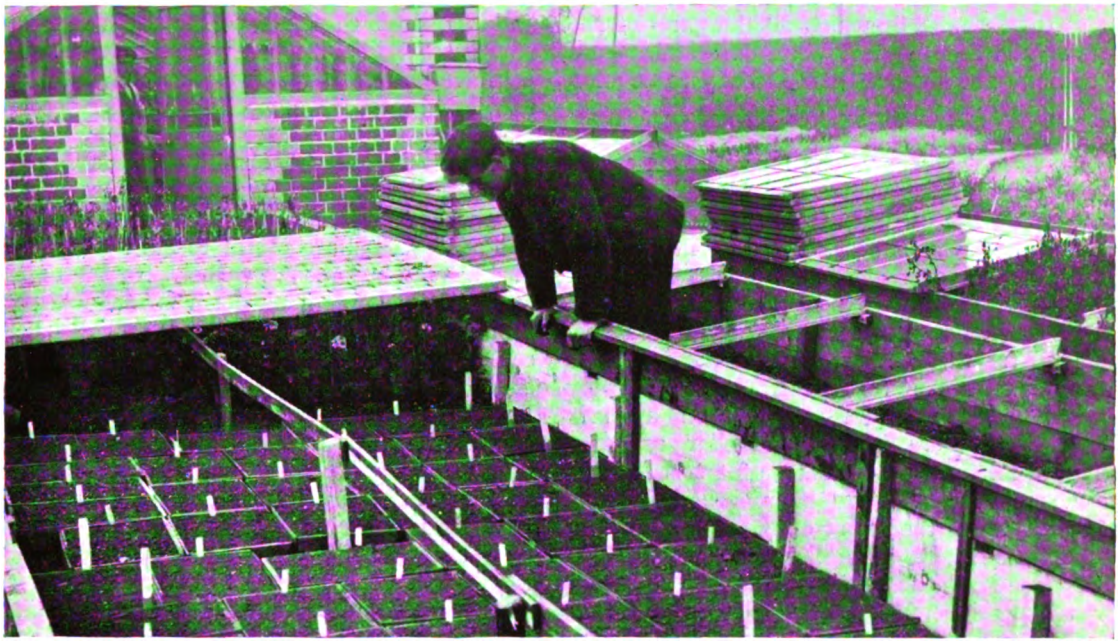
THE BULBS ARRANGED IN FRAMES

They are arranged like this after being planted in boxes (*see* page 206); then they are covered up with fibre or some other material



BLOSSOMS FOR YULETIDE

THE GARDENER MUST ALWAYS BE THINKING OF THE FUTURE—HOW THE FLORISTS HAVE PREPARED TO MEET THE GREAT DEMAND FOR BLOSSOMS THIS CHRISTMAS—BULBS, CHRYSANTHEMUMS, FLOWERS FROM RETARDED PLANTS—HARD WORK—THE GROWER'S RISKS

THE celebration of the joyous festival of Christmas takes place in the deadest season of the whole twelve months. The last traces of the glories of autumn have long since been obliterated, whilst as yet there is scarcely a trace of that great awakening of Nature's children which heralds the approaching spring. In this grey land of ours, the plants which open their blooms at this sunless time of the year could almost be counted upon the fingers of one hand. With these few venturesome blooms, and the various evergreens, our forefathers had to be content for the decoration of church and home. But, at the present time, the enormous and ever-increasing call for flowers, which, of course, reaches high-water mark at such festivals as Christmas or Easter, has caused the modern gardener to devise some means whereby this demand may be met.

Somebody has said that, to be a true gardener, one must be possessed of a vivid imagination, and, certain it is, that the successful horticulturalist has always to be thinking about the future. Months before the thought of Christmas has entered into the average man's mind—aye, even before the majority of people have returned from their summer holidays—the florist begins to prepare for the great festival.

Apart from the new system of retardation, which is threatening to turn the seasons topsy-turvy, the florist has to depend for his supply of Christmas flowers almost entirely on the naturally early spring blooming roots and bulbs. By special treatment and growth in heat these are forced into flower. Not all kinds of spring blooming plants will stand a great degree of heat and it is only after years of experimenting and selection that those which are best suited to the purpose have been discovered.

Above all other sorts of plants, those which

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are bulbous are the kinds *par excellence* for forcing. This is not difficult to understand, for, botanically speaking, a bulb is really little more than a bud, in which all the parts of the future plant—leaves, flowers, and stalks—are present in an advanced stage, ready to develop into a perfect plant on the arrival of certain conditions.

The florist's preparations for Christmas have their commencement in the importation of huge quantities of bulbs from Holland. Every year during the summer months millions of bulbs of all sorts and kinds come into this country from the land of the dykes. It is strange, when one considers the huge and steady demand for these bulbs, that no more definite attempts to meet it with a British-grown supply are made. The popular impression appears to be that there is some peculiar property about the Dutch soil which is not to be found anywhere else. Shrewd men are beginning to suspect that the secret of the Dutch growers' success would be more likely to be revealed by a close study of the special methods adopted by the foreigners. As a matter of fact, ths West Cornwall and Scilly flower growers alwaye raise their own Narcissi bulbs. It is, of course, imperative that these should be of the finest quality, as there is no market for small, poorly coloured blooms.

Now, before any bulb can be forced into bloom, it is essential that it should be thoroughly well rooted. And it is this fact that causes the florist to see to the planting of his bulbs as soon as he receives them. This forms no small part of the work of a flower-forcing establishment, and in a big place where, perhaps, some hundreds of thousands of bulbs have to be dealt with, many men will be kept busy for weeks. The bulbs are usually planted in some light soil in specially made boxes.

Meanwhile the preparations for the rooting-bed have been going forward. These beds are commonly made up inside frames, the glass lights of which are useful to shield the bulbs during very inclement weather. In the bottom of the frame a firm platform is made of some porous substance such as ashes, and this, being carefully levelled, is ready to receive the boxes of bulbs as they come from the planting-sheds. Each one of the boxes as it is placed in position is completely enveloped in cocoa-nut fibre, straw, or some such material, this being heaped up over the bulbs to the depth of six inches. And here the bulbs are left, to all external appearance simply to go to sleep. But should the visitor be sufficiently curious to visit the rooting-bed three months later and, carefully pushing aside the fibre, remove one of the boxes from its resting-place, he will see that no case for idleness can be laid to the charge of the bulbs. Each has a long yellow shoot, and, in some instances, even the flower-buds are beginning to put in an appearance, and every box is simply bursting with roots. And now, from an outsider's point of view, at any rate, the

AFTER BEING COVERED UP FOR TWO OR THREE MONTHS

The bulbs look like this when the fibre is taken off. They are now ready to be forced for the Christmas market

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interesting part begins. Every one of the bulbs seems to be filled with the desire to grow, and the introduction of the boxes into a warm greenhouse is little short of miraculous in its effect. In order that the plants may not receive any check through being too suddenly exposed to the full glare of daylight, the boxes for the first twenty-four hours or so are placed underneath the staging of the glass-house. The sickly yellow shoots very soon assume the more wholesome green, and when they are brought up into the light they begin to grow. And there is no mistaking the fact that they do grow —one can almost see them do it, and it is not at all unusual for the florist, in one short week, to be picking his flowers for the market.

The practice of bedding down plants in a rooting-bed is that adopted in the case of all kinds of bulbs such as Hyacinths, Tulips, Narcissi, &c. Freesias are treated in a slightly different manner, as it is found that the covering-up process encourages a lankiness of growth, which is very undesirable in slender-stalked plants. Considering the graceful bearing and delightful fragrance of the orange-throated Freesia blooms it is a marvel that they are not even more popular than they are. From the gardener's point of view Freesias are easy to grow, it being possible to raise flowering plants from seed within twelve months.

It is probable that the importation of Lily of the Valley roots exceeds that of any other kind of plants or bulbs. These are brought into this country as single shoots, technically called "crowns." Each "crown" contains one flowering spike and the accompanying leaves. These are chiefly imported from Germany, and the extraordinary popularity of this flower in England has caused the business of growing "crowns" to develop into prodigious proportions. Since the introduction of the system of retardation it has become the custom to grow

CHRISTMAS ROSES

Lilies of the Valley for the Christmas trade much more than was formerly the case. These frozen roots, which, of course, should have flowered last spring, are found to be much better for the early forcing. Unretarded "crowns" have always been a source of trouble to growers at this time of the year, in that they are very chary of developing their leaves. Of course the flower-spikes without the leaves are not of much marketable value. This difficulty is quite dispensed with when retarded "crowns" are used.

Every Christmas sees an increase in the number of flowers from retarded plants. Easter Lilies, Golden Rayed Lilies, Lilacs, Spiræas, flowers which half a dozen years ago would have been regarded as impossibilities at this season, are now scarcely looked upon as novelties.

In recent years a good deal of attention has been given to the introduction of Christmas flowering varieties of Chrysanthemums. The

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PLANTING BULBS

An extensive business in a flower-growing establishment

national flower of Japan is so satisfactory a blossom in every way as a cut bloom, that the number of late flowering kinds is bound to become larger. If the demand for coloured flowers was greater, it could be easily met by Geranium blooms. One would think that if ever there was a time when a little crimson would be appreciated it would be at this dreary season. But nowadays the general trend of the public taste is almost entirely in favour of white or yellow blooms, and, consequently, the florist is not encouraged to grow many kinds of plants which would supply coloured blossoms to brighten up the Yuletide festivities. People who know, however, say that there are signs that this remarkable prejudice to colour will, before very long, be a thing of the past.

Some of the autumn flowering violets will yield good crops of bloom at Christmas if provided with the shelter of a cold frame. In very mild seasons, and in the more westerly portions of our islands, these may be grown with success out of doors. So great is the market for the scented purple blossoms that " violet farming " is becoming quite a recognised industry.

An article on Yuletide flowers would scarcely be complete without a mention of the one blossom which is so closely associated with the season that it takes a part of its very name from the festival—the Christmas Rose. Now from time immemorial this lovely flower has been treated very badly at the hands of the gardeners. They will tell you that it is not worth growing because you can never get clean or perfect blossoms. They do not stop to ask themselves whether it is reasonable to expect nice flowers from plants which are fully exposed to all the miseries of an English December. People who grow flowers because they love them say that, if, as the buds appear above the ground, the protection of an ordinary glass hand-light be given to the plants, the most beautifully perfect blossoms of a pure white will result. One wonders whether the professional grower would be willing, for once in a while, to take a hint from the amateur gardener, for surely such lovely flowers, which can be produced almost for nothing, must be of some marketable value at this time of the year.

On the day preceding, and on Christmas Eve, the whole staff associated with a flower-growing establishment gives over everything else for the gathering and picking of the flowers. This blossom picking is not, by any means, so delightful as one might imagine, for the scent which is so pleasant in moderation is exceedingly objectionable when inhaled to excess in the close atmosphere of a glass-house. A bad sick headache is often the result of a day's work amongst the blooms. When the flowers are gathered they are carefully bunched preparatory to the important business of packing. Specially constructed shallow boxes, lined with tissue paper, are used, in which the flowers are placed in rows, on beds of cotton wool. The whole when complete is covered in with several thicknesses of tissue paper, and when the lid is on the air is practically excluded.

When the whole cost of the production of flowers at Christmastide—the original outlay, the immense amount of labour involved in planting, &c., and finally the really serious item of heating—is taken into consideration, it must be admitted that the actual price paid by the purchaser is very small indeed. There is a big element of risk, too, in the business, for the market is easily flooded with one particular kind of blossom, with the result that profits begin to dwindle and the grower thinks himself lucky if no definite loss is sustained. Still, there is consolation in the fact that every year the circle of customers is certainly increasing; for, from being merely a luxury of the well-to-do, flowers during the winter are beginning to be regarded as almost a necessity by the middle classes. Some day we may even see the working classes laying out a few of their hardly earned pence in Christmas blossoms.

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WHERE THE MISTLETOE GROWS

AMONG our Christmas decorations the mistletoe takes a conspicuous place, in dwellings of high and low degree. As a "kissing bush" it is styled and cherished by rustics all over England. A remnant of the old Druidical worship this, ensuring "good luck" and affection by a salutation under its magical branches. In those early days the mistletoe was called "All-Healing," a remedy alike for ills of body or mind.

The mistletoe is seen growing wild in many Midland counties, on poplar, thorn, pear, and crab, seldom on oak. In Scotland and our Northern counties it is never seen in a wild state. It is, however, very interesting work inoculating and cultivating it, and this is done in a very simple manner. A beginner should select a young apple-tree to operate upon. The mistletoe berries are ripe in April, when they should be used. Each berry contains a single seed. Choosing a young branch of the apple-tree (bark of two years' growth preferred), burst the berry, and then press on to the bark; the juice is sticky like glue and soon dries, sticking the seed with its germinating ovule firmly to branch. It is nourished primarily by the gluey matter, assisted by sun, air, and rain. A tiny root is then thrown out, which turns to the bark and pierces it; the new bark grows over and encloses it, and it then feeds on the life juices of the tree. The second year the leaves appear, but the growth is very slow, and much patience is required. Success is, however, well worth waiting for.

Our photograph shows a fine bush of inoculated mistletoe; it is of many years growth and, unlike most specimens, grows from the main trunk of the apple-tree and not the branches. So fine a bunch of mistletoe often causes the death of the tree; this one shows no sign of decreasing vitality, but is healthy and bears apples. The tree, however, does not increase in size as does its flourishing parasite. On a neighbouring tree the mistletoe, a big branch, has killed the branch it was on, and mistletoe and big branch were cut off recently. The tree, however, has not, in spite of this amputation, done away with its parasite; all over it, on every branch left, tiny leaves of mistletoe are sprouting out, and such a general loss of sap to the tree itself means its death at no distant date. It is impossible to eradicate mistletoe from a tree once inoculated. The curious fibres run under the bark from lower to highest branches.

INOCULATED MISTLETOE OF SOME 18 YEARS GROWTH

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THE KEYBOARD

The salesman depresses the plungers according to the amount of change wanted for his customer, and also depresses the "Order" button on the right. After the car has brought the change, and the transaction is completed, he brings the keys up again by touching the "Unison" button on the left. The machine (shown on the opposite page) keeps an automatic record of the amount of change it has issued each time, while the salesman on his part enters the amount of the customer's purchase in an ordinary sale-book

AN AUTOMATIC CHANGE-GIVER AND PAYMASTER

Illustrated from photographs specially taken for THE WORLD'S WORK

A REMARKABLE electrical apparatus, combining the functions of a pay-master, a cash-carrier, and a cash register, has been invented by Mr. Edwin R. Gill, of New York. His hair has grown grey in working it out.

The present writer had an opportunity of seeing the machine in operation recently in London, where it was in charge of Dr. Harriss, as representing the inventor. Its cleverness is perhaps most aptly shown when it is acting the part of automatic paymaster. Let us suppose it in service in the Navy or in a factory or workshop—any place where there are workers to be paid cash regularly.

The pay-clerk sits at a keyboard like a cash register, and near him, but at a higher elevation, is an apparatus containing the coin. When a man comes for his wages, the clerk simply presses the respective pounds, shillings, and pence buttons, and the workman holds his hand under the funnel and receives the money as it comes running down. At the same time also a typewritten record is printed on a slip of paper in the apparatus above. Hundreds of men could be paid in a much shorter time, and with much less labour, than by hand.

Mr. Gill's idea was to provide an apparatus to enable each salesman in a shop to get change for a customer quickly and conveniently without the employment of a cashier. A second object was to provide a mechanism which should count out any desired quantity of change and at the same time keep a record of the amount.

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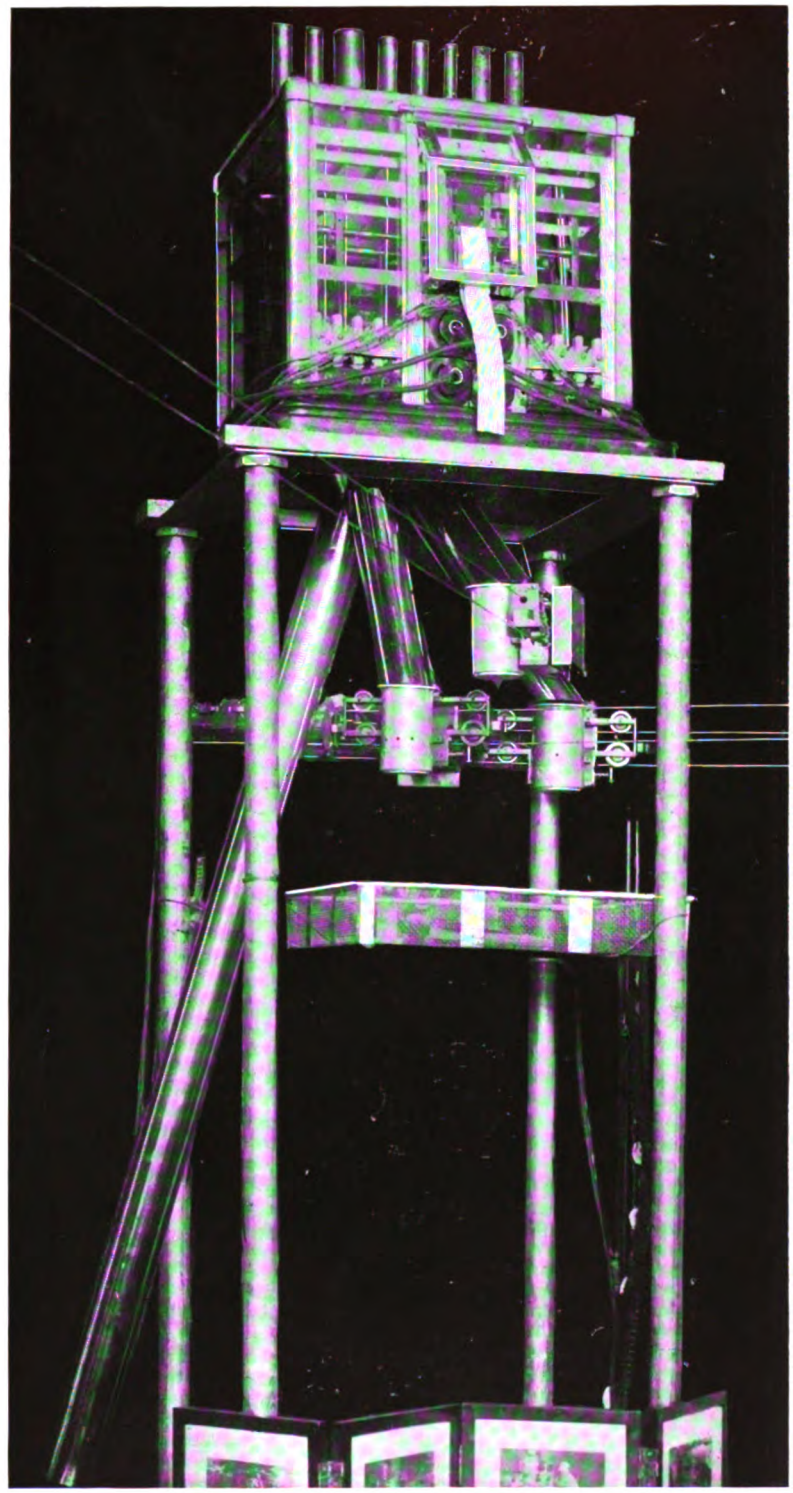
The invention consists of four principal parts—namely, the preparing device, the change-maker, the recorder, and the cash-carrier. The preparing device is under the direct control of the salesman; the change-maker and recorder are situated at what may be called the central money depositing station in the warehouse; while the cash carrier acts as a means of communication between the salesman and the change-maker.

Suppose then that a sale has been made, and the coins are to be deposited in the receptacle provided for them. Here we come to an interesting innovation. At present, with machines of the sort, the cash received from the customer is put in a ball, sent up to a clerk at a desk, who then puts the change into the ball and sends it back. But with the new apparatus the salesman secures your change first, and sends your coin up to the station afterwards. The salesman touches the keyboard according to the change he wishes to receive; that is to say, if a purchase amounting to 9*s.* 10*d.* has been made, and the customer has tendered a sovereign, the salesman will touch two keys—namely, 10*s.* and 2*d.* This throws certain levers into contact with the terminals under them. In a few seconds the change is dropped into the carriage at the central station by the mechanism there, and the carriage comes sliding along to the salesman immediately. He then puts in the sovereign he has



THE AUTOMATIC PAYING MACHINE

The workman holds his hand under the long funnel which is seen slanting down to the left in the above photograph, and receives his wages in a few seconds after the clerk has depressed the keys on the keyboard according to the required amount

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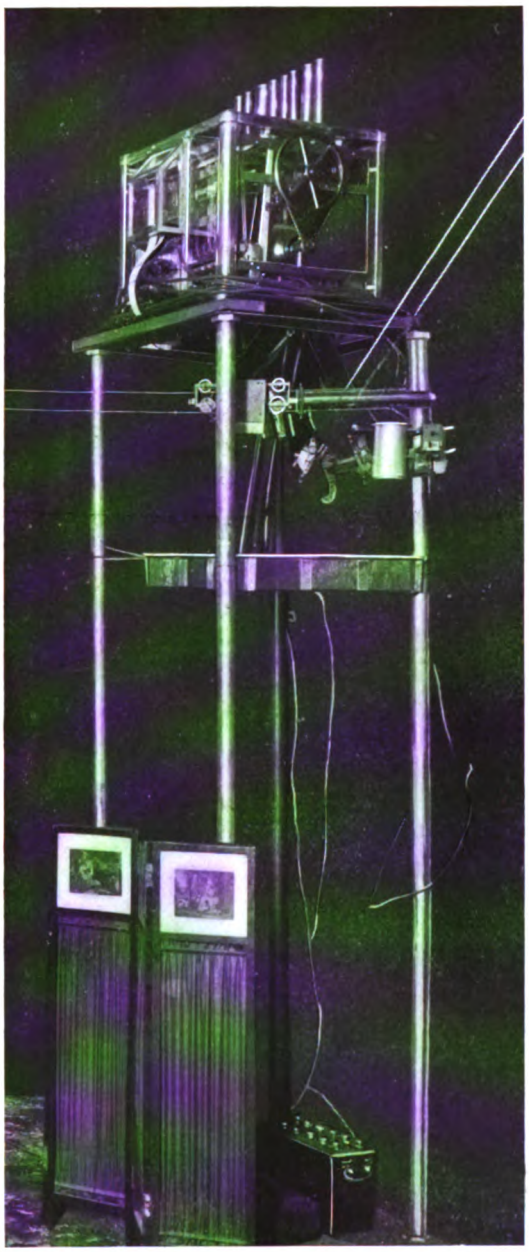


ANOTHER VIEW OF THE APPARATUS

The series of what look like pipes at the extreme top contain the various kinds of coins—half sovereigns, five-shilling pieces, &c., corresponding to the indicators on the keyboard (*see* p. 208). On the left of the internal mechanism is seen the paper containing the record of the transaction (this is more plainly shown on the previous page). The tray-like receptacle under the cars receives the money sent along by the salesman; the receptacle shown here is only temporary for the purpose of exhibition, and in a real installation this part of the apparatus would probably be enclosed. On the floor in the above illustration will be noticed the electric battery

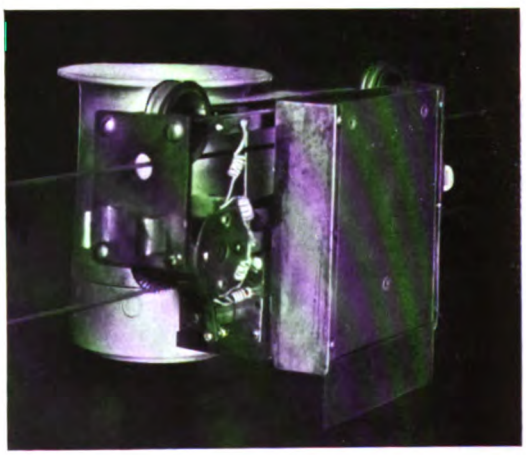
received. Meantime a typewritten record has been kept by the change-maker of the 10*s.* 2*d.* paid out. This printing mechanism is actuated by means of a record bar, and normally supported by the armature of the magnet. A printing ribbon carrying the ink for the record is fed from a roller. On his part the salesman keeps a record of the purchase in an ordinary little sale book.

Should any mistake be made by the clerk in putting his fingers on the wrong keys, he can instantly rectify his error by pressing the unison key to the left of the keyboard, which causes the keys to spring into position again. But once the order key to the right has been touched, the order cannot be cancelled.

One of the wonderful things about this machine is that it can be worked simultaneously by four clerks in four different parts of the building, duly recording everything on the ribbon.

The cash-carrying car is self-reversing and may be stopped and sent back by the salesman at any part of its journey. The adoption of the same principle on a large scale, such as for unloading trolleys from a colliery to a wharf or straight into ships, will immediately suggest itself to the technical reader.

Our photographs will convey to the reader an idea of the machine, which has doubtless a great future before it.



THE CASH-CARRYING CAR

The change is shot down by the machine into the tumbler-looking vessel shown on the left of the picture. The car then travels along the wires to the salesman, who, with a turn of his wrist, takes off the bottom part of the cylindrical vessel already referred to and finds the change he wants. He then returns the car, this time containing the money he has received from the customer. This duly drops out through the flap, shown open on the right

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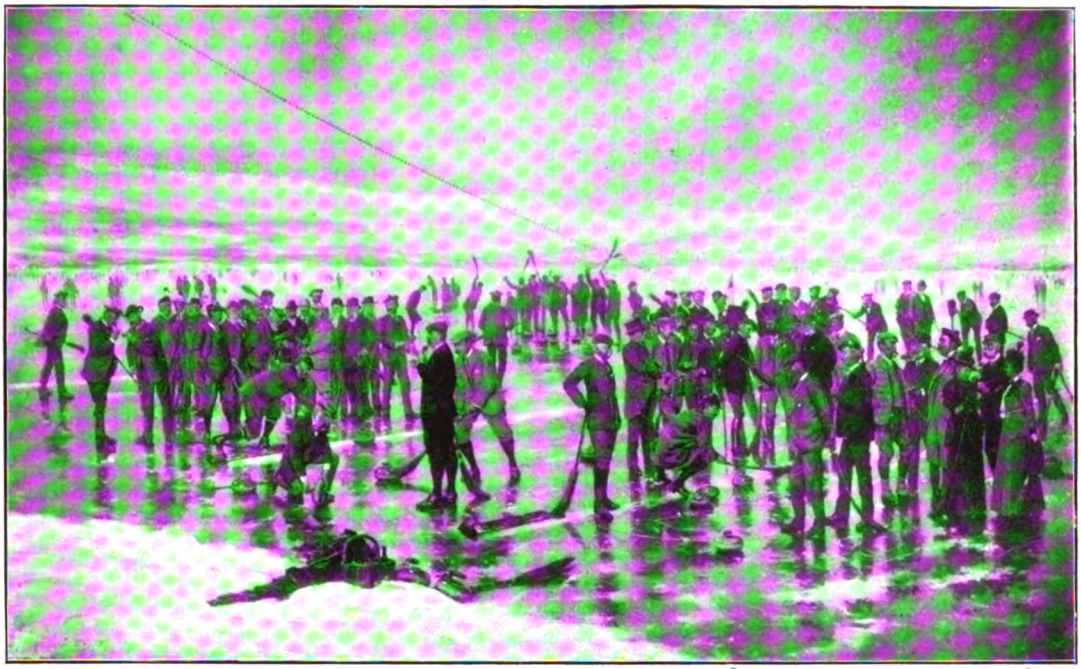
THE JUBILEE BONSPIEL OF THE ROYAL CALEDONIAN CURLING CLUB

From the painting by Mr. Charles Martin Hardie, R.S.A. The figures are all well-known Scottish curlers



THE ROARING GAME OF CURLING

A POPULAR WINTER PASTIME — CURLERS AND CURLING STONES — HOW THE STONES ARE MADE — A REVOLUTIONISED INDUSTRY — THE FAMOUS AILSA CRAIG ROCK

BY

R. J. MACLENNAN

Illustrated from photographs specially taken for THE WORLD'S WORK

THE cult of the curler is world-wide, but it is with the advent of December his quaint cries, "Soop her up," "Clap on a guard," "Give her heels," "It's a hog," are wont to echo throughout the United Kingdom. It is so, at least, when King Frost touches the land with his icy finger and confines the waters of pond, lake, and loch in a sheet of crystal, the curler's only regret being that his Majesty is an inconstant and fickle visitor, who evidently does not appreciate the genuineness of the welcome that awaits him whenever he chooses to make his presence felt.

Curling has a history that need not be dwelt on here. Its origin is uncertain. The earliest form was that in which the Kuting-stone, Kutty-stone, or Pilty-cock were used. These stones, without handles, varied in weight from five or six to twenty or twenty-five pounds, and were thrown in a different fashion from those now in vogue. The evolution of the polished circular stone of to-day is to be more directly traced from the rough block stones of later date, which, coming under no law of standardisation, were, as a rule, picked from the beds of rivers; a custom which gave rise to the Scottish "Channel Stane." They were given rough iron handles, and were known

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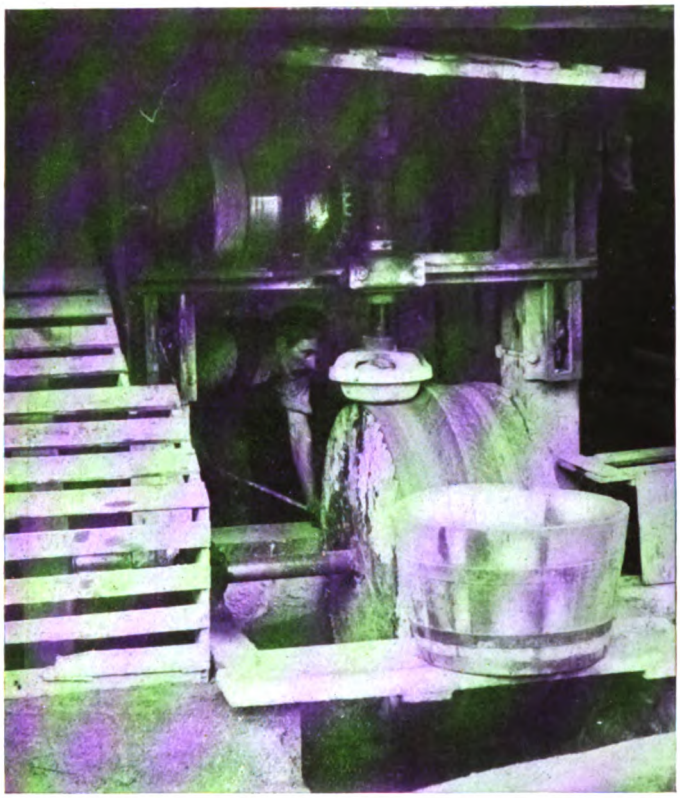

THE MAKING OF CURLING STONES
Grinding the stone smooth

by pet names, thus: "The Goose," "The Egg," "The Bannock," "The Kirk," "Buonaparte," "The Saut Backet," and others. The last-mentioned was a Coupar-Angus stone, weighing 116 lbs., truly "the bracing engine of a Scottish arm." The heaviest stone of this type is the famous Jubilee stone presented to the Royal Caledonian Curling Club by Mr. J. Wilson, Chapelhill, Cocksburnpath. It weighs 1 cwt. 5 lbs., beating its rival by 1 lb. It graces the table of the annual banquets of the club, and may be seen by any one in the rooms of the club in York Place, Edinburgh. It naturally follows that stones of such calibre and the lack of restrictions as to shape were a drawback to the progression of the game. With the advent of the circular-stone came standardisation. The maximum weight of a stone is now 44 lbs., but most of them are being made much lighter—from 34 to 36 lbs., science in play having, to a great extent, ousted mere physical force.

The manufacture of curling stones is not an extensive industry, but the interest of the process loses nothing on that account. The modern stones are known as "Crawford Johns," "Sanquhar Blocks," "Aberdeen Granites," "Carsphairn Reds," "Crawick Greys," "Crieffs," "Burnock Waters," "Ailsas," &c., taking their names from the quarries in which the stone is hewn. It is the Ailsa that is now the most popular among curlers. A fine quality of stone abounds in Ailsa Craig—"Paddy's Milestone," as the rock which rears itself in the estuary of the Clyde is familiarly called. The stone is shipped to the mainland in very primitive fashion, but there have been occasions when there was more of pomp and circumstance about the shipment, as when, for instance, the Marquis of Ailsa "hanselled" his new yacht *Columbine* by making its first cargo one of the rough round blocks.

The stone is of three qualities, Blue-hone, Red-hone, and Common Ailsa. The Blue-hone is considered to be the best, as it is much harder and closer in the grain than the others. The Red-hone at one time ranked first, but the quality of the rock has deteriorated. Manufacturers prefer the Ailsa stone to work with, it being more dependable; but among the other varieties the "Crawford John" is a favourite, although, unfortunately, it is seldom got without flaws, and these of such a nature as to be seen only when the stone gives way.

Now for the manufacture. A pile of the blocks, rough and unhewn, suggests a unique rockery; but there is little time for the grass to grow in the interstices, as the blocks pass almost immediately on arrival to the hands of the mason, and he, having given them their preliminary round-off, carries them to the turning machine, where, by the aid of a steam-driven circular cutter, they are more finely finished. To be more exact, the cutter is not steam-driven but rather the curling stone, the revolving action of which keeps the cutter in motion. It is next smoothed on the steam-grinding machine, the grindstone that accomplishes the work being indeed formidable, weighing over two tons, and requiring an engine of 20 h.p. to drive it. That in the picture is the one in use in Mr. Thomas Thorburn's factory, Beith, Ayrshire, and as we have been told that it only lasts for three weeks under ordinary pressure

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of work, it seems as though there was another story connected with the output of grindstones. The feature of the work at this point is the dexterity with which the expert controlling the machine places the stone in the clamp. It is placed there by hand, with the machinery going full-speed ahead, and to see it done is to experience a sharp thrill of excitement. He cannot explain how he has still four little fingers and a thumb on each hand. Only to him and to those who are intimate with the work does the fact stop short of a miracle. A most important part of the work, that of cupping the stone, is next performed. Cupping is the process of preparing the bottom for contact with the ice. It is hollowed out on a small grindstone, the rule being "Keen for dull ice, dull for keen ice"; one side of the stone being the keen side, the other the dull, the handle, of course, being adjustable so that either side may be used. The diameter of a keen cup varies from $2\frac{1}{2}$ to $3\frac{1}{2}$ ins., that of a dull cup from $4\frac{1}{2}$ to 5 ins., and great

THE FINER THE POLISH THE BETTER THE STONE

CHIPPING ON THE PROTECTING BELT

care has to be exercised in fixing the depth. Some players still prefer the smooth stone. The stone is by this time ready for use, but it is deemed necessary that, before it goes out into the world, it should receive a little polish and be fitted with something to guard it against the onslaught of its fellows on the curling rink. It is smoothed until it shines almost mirror-like, and the gloss improves not only its beauty but its utility—the finer the polish the better the stone, as any curler knows. Its guard is the chiselled line round the stone, this being the point of contact with others, and the preventive against cracking. The force with which the stones whirl along the ice is no mean one. It is a matter of history that the daring skater who had the temerity to cross the path of a stone impelled at full-speed by a strong arm has been carried home with an ankle-bone snapped clean through.

When being polished the stone revolves on steam-driven pivots, and various grades of sandstone are applied, it being finished off at fever-heat by special polishing putty powder. The belting is done by hand, as shown in the

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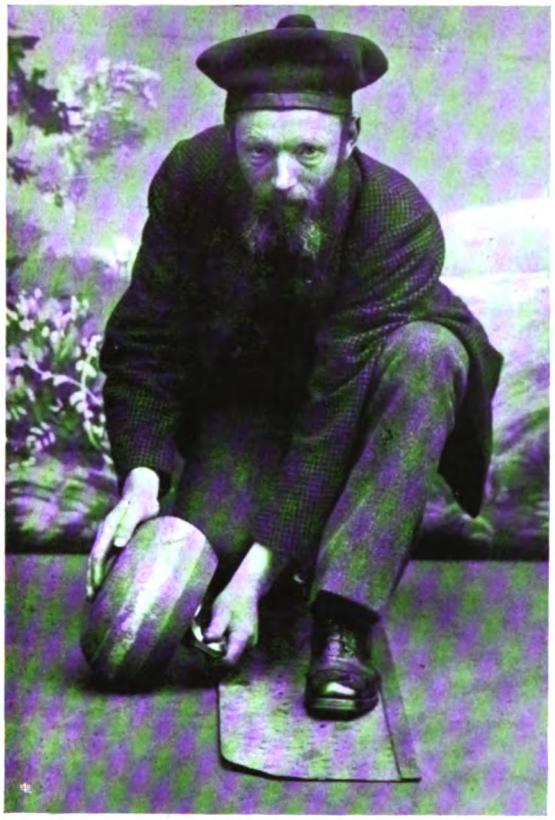
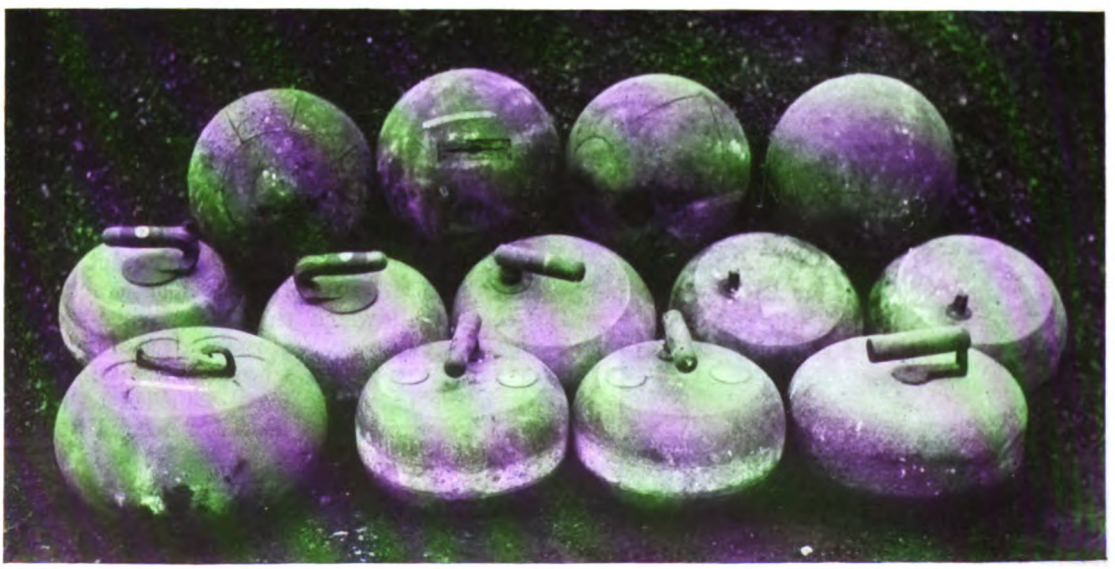


A CURLER CLEANING THE STONE

THE CURLING ATTITUDE

illustration, and when this is accomplished, the work is done. A glimpse of the store where the stones are kept awaiting orders from the Home Country, Canada, New Zealand, Russia, Switzerland, or the United States, as the case may be, reminds one of a cheese factory. The uniform piles make a brave show, as may be judged from the fact that the output of Mr. Thorburn's factory is 1000 to 1500 pairs per annum. Time was, over thirty years



SOME VETERAN CURLING STONES

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ago, when fifty pairs was a good year's work, but the cult of the curler has grown since then.

Before the introduction of machinery it required a small army of men to produce anything like the quantity to meet the demand. The old process was a tedious one. The stones were ground on a hand grindstone, each one being held in position by the thigh of the worker. In those days £5 was a low price for a pair of stones, but machinery brought them within the reach of every lover of "the roarin' game," and added hundreds of curlers to the Royal Caledonian Curling Club.

In the front row to the extreme left of the picture opposite is a fair example of the old-fashioned stone. Known as "The Beacon," it was played by a Mr. Miller, of Beith, a stalwart Scot, who turned the scale at twenty-one stone. It weighs 72 lbs., but is a pigmy to the Jubilee stone already referred to. Others in the picture were the property of the Ardgowan Club, Greenock, one of the oldest curling clubs in the kingdom, while the pair to the left in the second row belonged to General Neill of Swindridge Muir, to whose memory there stands a statue in the town of Ayr. The curious football specimens to the rear were in use for summer curling on an asphalt rink, a form of curling now out of favour. They were fitted with handles which, by the action of a spring, vanished into the interior, as the ball sped from the hand of the player.

A POWERFUL SHOT

At the present day enthusiastic curlers occasionally rejoice in the finding of a specimen of rock suitable for transformation into ideal curling stones. Lord Balfour of Burleigh was fortunate in obtaining a fine block from the bed of the Forth at the time when the foundations of the Forth Bridge were being laid. His lordship has many curling stones, but none more valued than those. One of the Earls Stair had a huge stone brought all the way from the fortifications of Sebastopol, which, after many other uses, found its way to the curling stone factory, and eight perfect pairs of stones—a full rink—were made from it.

When one considers the popularity of the pastime it is perhaps well that the enthusiast occasionally finds his stone elsewhere than from Ailsa Craig, for study of the petrologist's conundrum makes us pause. This is the simple question: "Ailsa Craig is 370 yards high, 1003 yards long, 860 yards broad, and 2¼ miles in circumference—area 220 acres. At the rate of over 1000 pairs of curling stone blocks per annum (twelve blocks to a ton) how long will it take to remove the Craig, clear the throat of the volcano of which it is the plug, and overwhelm the country?" The reader may work out the problem at his leisure.

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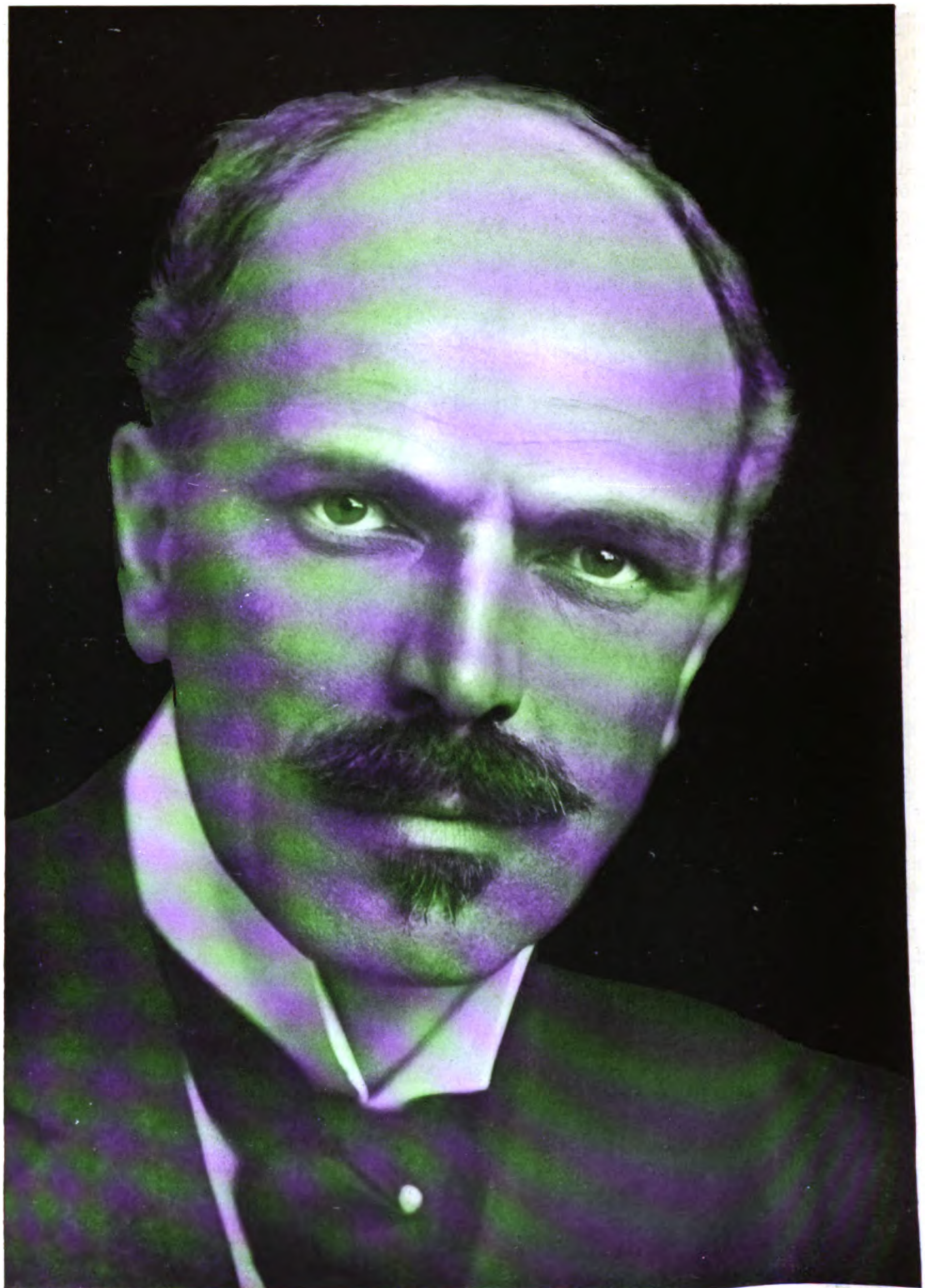

MR. MAURICE HEWLETT

THE DISTINGUISHED AUTHOR WHOSE LATEST BOOK IS REVIEWED ON THE OPPOSITE PAGE

A photograph specially taken for THE WORLD'S WORK

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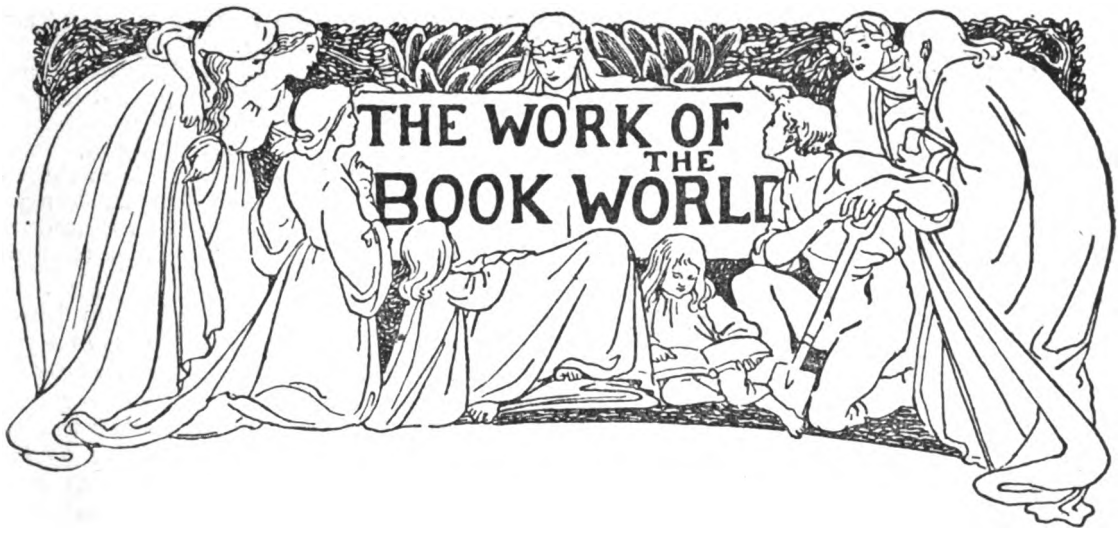

LONDON, *December* 9.

IN looking over our list of books this month one feels little hesitancy in giving first place among the authors to Mr. Maurice Hewlett. So striking is his pre-eminence that we have been impelled to ask, and fortunate in obtaining a special sitting from Mr. Hewlett, resulting in the fine portrait given herewith.

Tuscan Travel

It is not given to every author to illuminate whatever he touches upon. Many a one will succeed as a fictionist, yet fail utterly as a traveller. Some of the greatest writers have no sense of local colour. This is particularly noticeable in some of the greatest writers of Tuscany itself. Petrarch, Boccaccio, Pulci, Machiavelli, and Lorenzo are all names which rise to the tip of the pen, as illustrated by the fact that their work is literary and not local. Doubtless they could not, any of them, have written so appreciative a discourse upon the natural beauties, the romance, the soul of their native land, as this Englishman of a later day has done. Readers of Mr. Hewlett's "Little Novels of Italy" know well how tenderly and faithfully he reproduces the grey-green land of the olive and the vine. Yet even these might hesitate upon hearing that the favourite author had set out to write what he baldly calls a "Guide Book," even if they note that the book runs to two quarto volumes and is filled with the wonderful etchings of Mr. Joseph Pennell. But there are all manner of guide-books, and Mr. Hewlett has written the best kind of all. The title of the book *The Road in Tuscany* (Macmillan, 21s. net) is a faithful introduction to its character. Herr Baedeker travels always by train and gives you much detailed information about stations and railway inns. Mr. Murray seems to travel aerially, for he flits from church to church, from museum to picture gallery, giving no hint as to the character of connecting ways and by-ways. Professor Ruskin guided you from the pulpit, Mr. Grant Allen from the school-room, but Mr. Hewlett ambles along the Tuscan highway and carries you back to the coaching, posting-days of our grandfathers. There has been no such guide-book to Italy since the American novelist, Mr. Howells, posted across the peninsula during the middle years of the last century. There is a delightful frankness in Mr. Hewlett's views upon the things that go to make up the character of a country visited:

> "My commentary upon Tuscany was dictated by the logic of the road diverted only from its course by the accidents of travel, the humours of the moment, or by the freaks of memory and such familiar sprites of hours. I hope that I may say I have been strict with myself. I have always preferred a road to a church, always a man to a masterpiece, a singer to his song; and I have never opened a book when I could read what I wanted on the hillside or by the river-bank."

This text will give the reader the tone of book, in every way delightful, attractive; as pleasing to the eye as to the mind, and arranged in true guide-book fashion, with sub-titled paragraphs, and with appendices following each chapter. It is safe to say that many a future party setting out to do Italy will find here illumination and penetrating advice of a kind hitherto unavailable.

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A Popular Law Lord

It is not always easy to tell why certain public servants are chosen of the multitude for popularity over the heads of others who seem to be equally deserving. But it did not need two fat volumes of interesting incidents and anecdotes to show why the present Lord Brampton, long known and best known as Sir Henry Hawkins, is enshrined in the public heart in a higher place and a place apart. One reads very few pages in this book, *Reminiscences of Sir Henry Hawkins* (Arnold, 30s. net), without discovering the intense humanity of the man and his ability to touch the common pulse. It is a book of stories, for the most part gay. In fact he says at the beginning he will only tell one sad story, and that indicative of the change which has come over the administration of the law in his time. As a boy, leaning out of a window of Bedford School, in 1830, and watching the crowd on a market day, he witnessed this incident :

" Presently—and deeply is the event impressed on my mind after seventy years of a busy life, full of almost every conceivable event—I saw, emerging from a by-street that led from Bedford Gaol, and coming along through the square and near the window where I was standing a common farm-cart drawn by a horse which was led by a labouring man. As I was above the crowd on the first-floor, I could see there was a layer of straw in the cart at the bottom, and above it, tumbled into a rough heap as though carelessly thrown in, a quantity of the same ; and I could see also from all the surrounding circumstances, especially the pallid faces of the crowd, that there was something sad about it all. The horse moved slowly along, at almost a snail's pace, while behind walked a poor sad couple with their heads bowed down, and each with a hand on the tail-board of the cart. They were evidently overwhelmed with grief.

" Happily we have no such processions now ; even Justice itself has been humanised to some extent, and the law's cruel severity mitigated. The cart contained the rude shell into which had been laid the body of this poor man and woman's only son, *a youth of seventeen, hanged that morning at Bedford Gaol for setting fire to a stack of corn !*

" He was now being conveyed to the village of Willshampstead, six miles from Bedford, there to be laid in the little churchyard where in his childhood he had played. He was the son of very respectable labouring people of Willshampstead ; had been misled into what was more a boyish freak than a crime, and was hanged. That was all the authorities could do for him, and they did it. This is the remotest and the saddest reminiscence of my life, and the only sad one I mean to relate, if I can avoid it.

" But years afterwards, when I became a Judge, this picture, photographed on my mind as it was, gave me many a lesson which I believe was turned to good account on the judicial bench. It was mainly useful in impressing on my mind the great consideration of the surrounding circumstances of every crime, the *degree* of guilt in the criminal, and the difference in the degrees of the same kind of offence."

The Bedford School boy arrived in London as a law pupil in 1841, and took pains to become acquainted with the world outside as well as that within the Temple. He was very fortunate in the friends he made, and some of his most delightful recollections have to do with visits to Sir Edward Bulwer Lytton at Knebworth, where he at one time took part in the amateur theatricals given for electioneering purposes by the author-politician. The busy young man used to go up and down to London daily, evidence both of his devotion to his profession and his great love for the stage.

In all his records of the Bar, the racecourse, the stage, and letters, Sir Henry met with few more interesting characters than the Queen's Counsel and author, Samuel Warren, whose famous novel, " Ten Thousand a Year," was the delight of a former generation. He devotes a whole chapter ,to this subject, and even then finds later on further stories to tell. Here is one of them :

" I am reminded of another story about Sam Warren, than whom no writer was ever more solicitous of fame. It was a proud moment whenever there was the remotest allusion to his authorship, and I always loved to compliment Sam on his books.

" In the famous case of Lord St. Leonards' will, which had been lost, I supported the lost will, and proved its contents from the evidence of Miss Sugden and others.

" Sam Warren had been in the habit of visiting Lord St. Leonards at Boyle Farm, Ditton. He gave evidence as to what Lord St. Leonards had told him respecting his intentions as to the disposal of his property.

" After examining him, I said, with a polite bow : ' Mr. Warren, I owe you an apology for bringing you into the Probate Court. I am sure no one will ever dream of disputing *your* will, because you have left everybody ' *Ten Thousand a Year !* '

" Whereupon Warren bowed most politely to me in acknowledgment of the compliment ; then bowed to the *Judge*, and received his lordship's bow in return ; then bowed to the *jury*, then to the *Bar*, and, lastly, to the *gallery*."

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Literary Memories

Probably there is no literary Frenchwoman better known to English readers than Madame Juliette Adam. Some years ago when she wrote her recollections of Parisian Society, the book had a success with English readers quite as pronounced as it achieved in France; and this is saying a great deal for a book by a French writer. When, therefore, Madame Adam appears again before English readers with a volume called *My Literary Life* (Unwin, 8*s.* 6*d.* net) she is sure of a welcome and of widespread attention. The volume in every way merits these. It gives as much a picture of everyday life in upper French circles as details concerning the appearance and personalities of famous literary characters. Beginning while the author was yet a provincial, the story retraces Madame Adam's first visit to Paris in those gorgeous days when the Second Empire was at its zenith. It is wonderful that so old a Parisian should remember with such freshness and so vividly her first impressions of the city of light. Even in those early days the leading issues of French life pass in review; politics, positivism, with the great Auguste Comte himself appearing, and the first and most famous Universal Exhibition, which was at its height when Madame Adam became a Parisian. Each page brings up memories and pictures of the past. There are comparisons of Rachel and Ristori in their great *rôles* at the Française; there are current criticisms of the first books of Taine and constant meetings with and allusions to the elder and the younger Dumas. There is a very pretty story of Meyerbeer. Madame Adam went to a fancy dress ball as Veléda. Her host pointed out to her a little old man and leading her to him said:

"'Shall I introduce you?'

"'No, no,' replied the old gentleman, 'I am afraid of her.'

"'Afraid of me, Monsieur,' I said, laughing, 'Why?'

"And then Monsieur Weill introduced Meyerbeer to me. I was an enthusiastic admirer of Meyerbeer and I told him so. He was embarrassed by his accent, and was both timid and reserved, and he said to me hesitatingly that I should not say such things to him. They were too complimentary, coming from me. Alexandre Weill laughed and exclaimed: 'Love at first sight! Love at first sight!' Meyerbeer hurried away.

"'You see,' Alexandre Weill said to me. 'When you entered the room he was thunderstruck, for he is even a greater poet than he is a great musician and he has thought for a long time of creating the *rôle* of Veléda, and when he saw you he came to me and said, as though frightened:

"'She will make me forget my Seléka! I am too old to fall in love with a new face, even in art. I never wish to see that woman again.'

"'Let us find him,' I said. 'He must resuscitate Veléda.' Meyerbeer had disappeared. Every morning after the ball I received, during many months, a little bouquet of violets, and with the first one these simple words: 'A tender souvenir to Veléda, Meyerbeer.'

"Later he sent me a box for the first performance of *The Pardon of Ploërmel*, but I never saw him again."

Perhaps the most fascinating chapters of the book tell of the author's friendship with the two famous women writers who called themselves George Sand and Daniel Sterne. These great ladies were not at all on friendly terms, and it was at first impossible for their young contemporary to be equally the friend of both. But she was in turn intimately associated with each, and her memories are a valuable contribution to their personalia. The book is attractively illustrated with reproductions of old engravings of the men and women who appear in its pages, including besides those mentioned, About, Berlioz, Flaubert, Simon, Mérimée and Sainte-Beuve.

Mr. Whibley's Essays

Mr. Charles Whibley has long since acquired for himself a place as interpreter of the literary elect. Therefore when he comes forward with a volume of *Literary Portraits* (Constable, 7*s.* 6*d.* net) he is sure of an appreciative audience. This is a volume of essays, some of which have appeared in the magazines. A mere enumeration of their titles will best give the reader an idea of the fine savour of the dish set before him. There are chapters upon Rabelais, Philippe de Comines, Montaigne, Robert Burton and Jaques Casinova. A very attractive chapter upon "The Library of an Old Scholar" is particularly concerned with the books of William Drummond of Hawthornden. Mr. Whibley makes an interesting comparison between the annotations and indexes of Drummond's library and that of Samuel Pepys, a comparison which is, in itself, a veritable feast of old titles and half-forgotten authors. The essays are lighted up with critical passages showing a notable insight into literary methods. For instance, in speaking of the vocabulary of Rabelais, Mr. Whibley says:

"Above all, slang must be suitable, and must chime with the matter in hand. No greater master

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of the popular speech than Rabelais ever lived. Yet though he harbours all the outcasts, he never makes his reader conscious of bad company. His specimens of the Bohemian tongue may raise a laugh; they can never inspire disgust. And Urquhart knew as well as his master the proper use of this dangerous material: he too was a curious student of the hedges and the by-ways; no phrase was too common for his curiosity, or too vulgar for his sense of style. But the effect he produces with words which are common and vulgar is always right, and often splendid. You may see a gold cup. studded with stones rough and ill cut, yet noble by the mere force of contrast and arrangement."

Or again, he speaks of Montaigne's style as fully equal to the demand made upon it.

"It was in Sainte-Beuve's phrase, 'the instrument of his charm, the true wand of his enchantment,' for he wrote not as a maker of plain prose, but as a poet. There is scarce a sentence in his book which is not brilliant with imagery, and his fancy is so rich in metaphor, that the variety and colour of his writings are inexhaustible. Yet with a rare lapse from knowledge of himself, he affected to despise his style. . . . But in this matter of style Montaigne is uncertain and contradictory. At the outset he had made up his mind that he was not a writer, but a landed proprietor with something to say. He regarded his 'Essays' in the spirit wherein Congreve regarded his comedies, as trifles beneath him. Like the author of 'The Way of the World,' he desired to be accepted on no other footing than that of a gentleman, and there was no Voltaire to administer the reproof that had he been so unfortunate as to be a mere gentleman he would not have been worth a visit. He held, may be, that while a country squire might honourably tell the truth, he fell below his position if he involved himself in the intricacies of style."

World Travel

It cannot be in reference to the size of his volume that Mr. James Pinnock calls his *Wander Years Round the World* (Unwin, 21s. net) a "modest" record, for it is a thick and heavy book filled with maps and diagrams and many photographs of the kind sold to globe trotters generally. The qualifying adjective is better suited to the simple record which Mr. Pinnock gives in journal form of his experiences day by day in a journey which was to last a few months but which really spread itself out over several years and over all quarters of the globe. The book becomes, in short, a sort of guide-book, full of recommendations as to hotels and travelling arrangements. The record begins in October 1901 and ends on the Tilbury Docks in May 1904. During this time the traveller stayed in 113 different hotels, and in addition to long and numerous land journeys, travelled by thirty-two different steamers considerably over 50,000 miles. He set out from England to the West Indies, went thence by way of Mexico and California to Japan, from Japan did China and Australasia, then India, East Africa, and the Mediterranean before again reaching home. Mr. Pinnock and his friend Miss Bates are cheerful travelling companions and he has obviously published what he calls his jottings in their collected form that they may be welcomed by personal friends and by others who have read extracts from them appearing from time to time in the public press during his absence.

A very remarkable book of travel is that called *Through Town and Jungle* (Unwin, 21s.). This is a record of 14,000 miles on bicycles among the temples and people of the Indian plain by Mr. and Mrs. W. H. Workman, already well known as travellers in the Himalayas, in Algiers, and as bicycle travellers in Iberia. This book has a wonderful collection of illustrations, many of which seem to be of the interesting kind specially taken by the writers and not of the type so well known to railway bookstalls. Cycle touring in India must involve a greater strain on the cyclist than it does in Europe in proportion to the higher temperature, heavier roads, greater amount of luggage carried, and the frequency with which it is difficult to obtain good food and adequate rest at night. As a rule nothing can be obtained to eat in Indian villages, and the cyclist must carry his food with him, often enough for several days. Mr. and Mrs. Workman have thoroughly covered the country available to their method of travel. They met with any number of courtesies from both Indian and British governors and had also an unusual opportunity for insight into the daily lives of the common people, whose interest in and curiosity about their method of locomotion made them more forward than usual in seeking acquaintance with the travellers.

The Duchess, the Poets, and the Cripples

The ever-charitable Duchess of Sutherland has never appeared in more gracious or more graceful light than in the volume of short poems she has had printed by the Potteries and Newcastle Cripples Guild, and published on its behalf. These contributions, generously given by living poets, are gathered under the title *Wayfarers' Love* (Constable, 6s. net),

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edited by the Duchess herself, and decorated with a cover design given by Mr. Walter Crane. The title is found in this quotation from an old tale:

"'Let me take your hand for love and sing you a song,' said the other traveller, 'the journey is a hard journey, but if we hold together in the morning and in the evening, what matter if in the hours between there is sorrow?'"

As President of the Guild, the Duchess writes an introduction, telling of its foundation some three years ago in those towns of North Staffordshire where the manufacture of china and earthenware is the chief occupation of the people. The Guild has been successful in giving employment to more than three hundred crippled children, in developing their artistic instincts, and in teaching them to lead useful lives. It was the desire of the printing members of the Guild to undertake not only commercial printing, but to prove their skill by producing an edition of some work of literary value. Then it was that the patroness turned to the poets, begging them to contribute a volume which the Guild should print, and from which the money accruing should enable more little cripples to be brought into the workshops. The volume is a most successful one, embracing contributions from nearly every member of the guild of modern poets. We can give here but two brief examples. One from Mr. Henry Newbolt, and Mr. Owen Seaman's charming Envoi:

VICE VERSA

(*To My Daughter*)

If buttercups were white and pink
  And roses green and blue,
Then you instead of me could think
  And I instead of you.

Then I could daily give your doll
  Her early evening tub,
While you in easy-chairs could loll
  At some or other club.

Then I could spell *p-i-g pidge*,
  And learn to sew like nurse,
While you could take a hand at Bridge
  And murmur "Zooks!" or worse.

Oh, it would be as fresh a sight
  As ever yet was seen,
If buttercups were pink and white
  And roses blue and green.

ENVOI

Go, little Book, with God to speed
For pity's sake the cause you plead!
  And if to have a gentle heart
  Amend whate'er you miss of art,
Haply a few herein shall trace
Somewhat of Master Chaucer's grace
  And crown with meed of fair largesse
  This later *Boke of the Duchesse*.

Our Neighbours and the Tariff

Professor Percy Ashley has supplied in compact form what many readers and writers of the present day are seeking, a brief and succinct account of the development of a Protective Tariff in those countries most frequently cited for examples in the present Fiscal Controversy. Under the title of *Modern Tariff History* (Murray, 10*s.* 6*d.* net) he provides students with a lucid and, as far as he found possible, unpartisan sketch of the development of the protective policies of Germany, the United States, and France. The volume is composed chiefly of material used in lectures delivered at the London School of Economics in the Lent and Summer Term of 1904. Mr. R. B. Haldane, to whose suggestion it seems the book owes its origin, has written a preface explanatory. Mr. Haldane held that the only method of discovering the economic situation as it exists among our neighbours is the historical method. It was as a result of his desire to examine the new political issue in this spirit that Mr. Haldane met with, and secured the co-operation of, Mr. Percy Ashley, who had been working as an economist at kindred problems. After twelve months of discussion and joint reading they found they had collected a mass of material which Mr. Ashley used in his lectures, and which was subsequently made into this book.

The current fiscal controversy has been responsible for the publication of books without end. Its influence has extended even further and has brought about the republication of almost forgotten volumes. Among these latter will be found the new edition of a translation of Friedrich List's *The National System of Political Economy* (Longmans, 6*s.* net). The work of the famous German economist was well known to that earlier generation which fought over the downfall of Protection in England. For the general reader there is much of interest in this famous German's criticism of a famous Scotchman. The earnest student of the various branches of national economics involved cannot afford to be ignorant of the theories and examples advanced by Adam Smith's best-known opponent.

It is, perhaps, natural that the reader should suspect every book on economics published at this time of dealing with the fiscal controversy. In the first chapter of a new series of

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essays by Mr. L. T. Hobhouse, *Democracy and Reaction* (Unwin, 5s.) the writer discusses the school of Cobden, but beyond this the book treats in a very interesting way of various developments in latter-day government. Perhaps one of the best chapters deals with the growth and spread of the Imperial Idea, looked at from what may be called a liberal and almost an anti-imperial standpoint. Paradoxical as it may seem, Mr. Hobhouse holds that the new conception of empire had its roots, politically speaking, in the older Liberalism. For he holds it was the older Liberalism which made the colonial empire what it was, and it was to that empire as Liberalism had made it that imperial sentiment in the first instance appealed. There are other essays worth noting upon the Intellectual Reaction, the Limitations of Democracy, and International Rights.

The Congo Free State

If the world has heard much of late for and against the existing order of things in the Belgian Dependency it is likely to hear much more as a result of Mr. E. D. Morel's vigorous treatise upon *King Leopold's Rule in Africa* (Heinemann, 15s. net). There is no doubt that the increasing portion of the civilised world which looks with horror upon the condition of affairs in the Congo Free State owes a debt of gratitude to Mr. Morel for the courageous way in which he has thrown down the gauntlet to those responsible for this sore spot on the earth's surface. Undoubtedly Mr. Morel courts all manner of reprisals, from the confiscation of his book on the continent to suits for libel in this country. Never ceasing in his propaganda he is now or was lately in the United States, seeking to interest President Roosevelt's Government in originating that interference which international complication makes so difficult for Cabinets on this side of the water. It should not be forgotten, however, that resolutions in favour of this interference on the part of the Great Powers have unanimously passed in the House of Commons, and the work begun by the Aborigines Protection Society in September 1896, is reaping daily a wider harvest of interest and sympathy. The book is very fully illustrated and abounds in particularly horrible photographs showing the inhuman punishment alleged to be meted out to the African subjects of Leopold II.

A Novel of Real Thrills

At this day and date there can be little doubt of the power and strength of Mr. Jack London as a writer of fiction. In the beginning one heard much of his being brutal for the mere sake of brutality, and for a while there clung to his name something of the offence of Zolaesque realism. Since "The Call of the Wild" all this has changed; that epic of the dog placed its writer upon a high plane indeed. In his latest novel *The Sea Wolf* (Heinemann, 6s.), Mr. London has accomplished even a greater *tour de force*. He has written the adventures of a North Pacific whaling schooner in a way to compel the close attention to the very last line of the most fastidious reader. His chief character, one cannot say hero, is an absolutely inhuman type of devil-man, a sort of reincarnation of Milton's Lucifer, appearing as a very modern Scandinavian Viking, who is also a materialistic philosopher of the grossest type. Those who know Mr. London's Klondkye stories, need not be told how vividly he realises the life of this handful of mere animals in men's form, under the sway of their monstrous leader. An effeminate dilettante of San Francisco, wrecked in a fog-ferry accident, is swept out to sea, picked up by the whaling craft, and carried as a kitchen drudge on its northbound voyage. If most care is lavished upon the character of Wolf Larsen, the captain, not a little is spent upon the exposition of the weak coward castaway, who tells the story of his own subjugation, his submission to every degradation, rather than seek the only escape available—death. There seems only one weak spot in this record of the character of these two men and their associates. This is where Mr. London has seen fit to bring in the only woman character of the book. It would have been better without her, and have lost none of its strength. Readers who are seeking a novel of real thrills, and told too in an admirable literary style, will find *The Sea Wolf* very difficult to put down, however dark the winter's day, however late the night.

Good and Amusing

We can recommend to all readers of a good love-story one by the author of "Elizabeth's Children," entitled *Helen Alliston* (Lane, 6s.). The heroine, whose name gives the title to the book, persistently ignores and refuses the love of Boyne Carruthers, who, however, is constant to her, and finally has his reward. The story is enlivened by a large family of precocious children who become devoted to Helen, and are always turning up just when they are most needed for distraction from trouble and anxiety. A most humorous character is Mrs. Stanley

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Browne, who, becoming suddenly wealthy at the death of her brother-in-law, who owned a small grocer's shop and made a fortune out of pickles, desires to live up to her new position in life and commits innumerable outrages upon etiquette. She engages Helen as companion, and Boyne as tutor to her son, and it is under her roof that most of their romance is enacted. The author displays a fine wide range of observation, and all in all the story is one which to read is to enjoy.

A Novel or Two

Readers who delighted in "The Story of Eden," and "Uriah the Hittite," will not be disappointed in Miss Dolf Wyllarde's *Captain Amyas* (Heinemann, 6*s*.). If in "The Story of Eden" Miss Wyllarde gave a piteously cruel account of the downfall of a woman, in her later book she has no less traced in every detestable detail the degradation of a man. The gradual transformation of the clean honest youth into a sensual reprobate was never more completely described. Miss Wyllarde makes her people to live. She is not always so fortunate with her incidents. One somehow fails to believe that officers of the Merchant Marine are as prominent factors in the lives of ocean travellers as this book makes out. Neither does the climax, whereby justice is dealt out to one sinner at the expense of many innocent people, appear in the cloak of probability. One doubts the end of the story, but one never doubts its leading characters.

Another short story, charmingly told, and charmingly printed, is Mrs. Frances Hodgson Burnett's child's story, *In the Closed Room* (Hodder and Stoughton, 3*s*. 6*d*.). This is one of those stories half real, half fairy, in which Mrs. Burnett has succeeded so often in painting the life of a dreamy child with imaginary playmates, and with an inevitable fading away through death into the bright realms of imagination.

The success of "David Harem," of "Lovey Mary," and of "Mrs. Wiggs of the Cabbage Patch," has much to answer for. One of the latest of this tribe of homely fiction is *Aunt Huldah*, by G. M. Cooke and Alice Macgowan (Hodder and Stoughton, 6*s*.). This new philosopher in petticoats is an inhabitant of the Texas ranch country, where she mothers orphans, whether of tender or mature years. All opportunity is given her for the exercise of her smiling philosophy, and it is needless to say that she overcomes difficulties by the faith which makes even mountains to tremble.

MR. BALFOUR AND MR. CHAMBERLAIN

(From *Cartoons in Rhyme and Line*)

"But all is right as right can be
Since the country's governed by you and by me."

The Lobby Laureate

The veil of secrecy which has hitherto shrouded the authorship of various poems and epigrams in circulation at Westminster is lifted in a noteworthy volume called *Cartoons in Rhyme and Line* (Unwin, 4*s*. 6*d*. net), by Sir Wilfrid Lawson, Bart, M.P. and Mr. F. Carruthers Gould. Of Mr. Gould's caricatures there remains little to be said, assuredly not in this magazine where they have so often appeared as prominent features. Mr. Gould is so easily the first of present-day caricaturists

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"JOE" MAKES OUR FLESH CREEP
(From *Cartoons in Rhyme and Line*)

that one must perforce forgive him his evident delight in Mr. Chamberlain. Where the artist seems never to tire he can at least depend upon the uncomplaining sufferance of his admirers. Of the contributions of the Lobby Laureate there are more unhackneyed things to say. Sir Wilfrid disarms all adverse criticism at the start by dedicating his little book "From the worst of poets to the best of wives," and in a note to the reader he very aptly states the whole case:

"If any one thinks that these verses are 'rot,'
I'm the very last person to say they are not;
If any one says they are witty and wise,
The verdict will give me a pleasant surprise;
But whether wise, witty, or stupid they're ruled
You're sure to admire the 'setting' of Gould."

One might find many fit quotations both of a kind to approve and of a kind to disapprove. The verses extend over a long period of years, and verses written in 1876 and 1883 celebrate quite different situations from those dated within the past two years. Through the kindness of the publisher we are enabled to give two of Mr. Gould's illustrations, in one of which John Bull says to Joseph Chamberlain:

"Oh, why should you inquire, my Joe?
What is there that you do not know?"

In the other both the author and the artist make rather an effective criticism of their own harping upon a single subject:

"If any one does grievous wrong,
And who you wish to know;
If you inquire you'll find 'ere long
The author's *always* 'Joe.'"

Sometimes Sir Wilfrid, however, includes in the book little verses which might have been well enough for passing around in Parliamentary lobbies, but which in cold print, in a bound volume, look out of place. One of these is called "Lord Burton to the King."

"'Twas beer, your majesty, strong beer,
Which as you know made me a peer;
If you will only learn to brew,
God knows what it will make of you!"

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More about Sir Walter

Another volume of *Letters and Recollections of Sir Walter Scott* (Smith, Elder, 10s. 6*d*. net) will be heartily welcomed, for the reader is always glad to hear more about Scotland's grandest man. The recollections which are set down in this latest volume are those of Mrs. Hughes of Uffington, whom Sir Walter in his last days described as "ever the same, the best and the kindest to me." The greater part of the volume consists of diaries which Mrs. Hughes kept of her two visits to Abbotsford, in 1824 and 1828. No more fervent admirer and disciple could be imagined. Of Scott's kindliness, she says:

"It is said that lawyers are of all men the most likely to conceive an unfavourable impression of human nature; if it be so, Sir W. is an exception, for I never met with any one so prone to see the actions of his fellow creatures in so kind a view: it seems as if he judged all hearts by his own: his whole study seems to be to diffuse happiness on all around him."

Mrs. Hughes relates many instances of how the Waverley Novels had taken possession of the people of Scotland. The following is an incident in Edinburgh:

"After dinner we walked on the Calton and met with two most civil cicerones in two old Burghers who were taking their evening *toddle* on the hill. I asked about St. Leonard's Craigs; and one of them pointed them out. 'Ye'll hae read they tales?' I assented. 'Ye'll see that house ower by the red-tiled roof, that is Dumbie's house, and up beyont is the auld Covenanter's—I canna mind the name—' I said 'Douce Davie.' 'Ay, ay, just sae—weel and there's a window whar the puir misguided lassie got out after she had the mischance.'"

It was the same at Linlithgow Palace—the old lady who acted as cicerone insisted that it was in the Chapel that the apparition appeared to James IV.:

"'Ye'll observe Sir Walter Scott has made it out in one o' his bonny rhymes to have been in the church, but sure I hae a better right to know than he has, for me and my Forbears hae showed the palace these two hunder years, and he never was here but once in his born days, that I ken of: Sir W. is a gude man and a great credit to Scotland, but he must have done it for the sake of some rhyme when he tauld everybody it was in the church; I'll appeal to a leddy of judgment, if it was likelt the King wud fyle his feet by going out o' doors to the church when he had sic a bonny chapel as this for his devotions.'"

Every one knows the story of how deeply Scott was touched by the tribute he received during a visit to a London mansion, when the servants hearing of his coming, asked to be allowed to stand in two rows in the hall that they might see the great man as he passed between them. Another story of the same calibre also belonging to London and his last years, is not so well known as not to bear repeating in Mrs. Hughes's version—and with this we send lovers of Scott to the book itself:

"Sir W. was so much pleased with the Yarmouth Bloaters on the day (Oct. 8th) on which he breakfasted in Amen Corner, that Mrs. Lockhart desired me to procure her half a hundred: as soon as they drove away I went to Mr. Bateman, a great salesman in Billingsgate, and I gave the order; he replied that such a number would not suit a private family, for owing to the manner in which these fish are cured they will only keep good a short time. I then desired half the quantity to be sent to Sussex Place: he answered decidedly but civilly, that it was not their custom to send so far. I do not know what prompted me, but I said almost involuntarily, 'I am very sorry the order cannot be complied with—it was for Sir Walter Scott.' The rough fishmonger started back, and pushing forward to me through his piles of fish cried out most loudly, 'Sir Walter Scott, did you say, Madam! Sir Walter Scott—God bless my soul! He shall have them directly if I carry them myself—Sir Walter Scott!—They shall be with him to-night'—then pausing—'No, not to-night—for to-morrow morning at seven o'clock a fresh cargo comes in, and he shall have them for his breakfast. Sir Walter Scott!' Then with a very grave look and in as soft a tone as his loud voice could be lowered to, he said, 'They say he has been ill, and is not well now—*how* is he?' Mr. Bateman kept his word and Sir Walter was more pleased than I can describe when I related the words I have been writing: he laughed and said, 'I do not think my works ever produced an effect so much to my taste before.'"

Readers of this magazine will find much of a kindred interest to what has appeared in its pages in *The Story of British Trade and Industry*, by Mr. James Burnley (Newnes, 1s.). Mr. Burnley has sketched in outline the leading features of industrial progress from the days of barbarism to the most recent times. The author thinks that at a time like the present, when so many halt at the fiscal cross-roads, it is well that the lessons of the industrial past should be studied. And to this end he has compiled his comprehensive manual.

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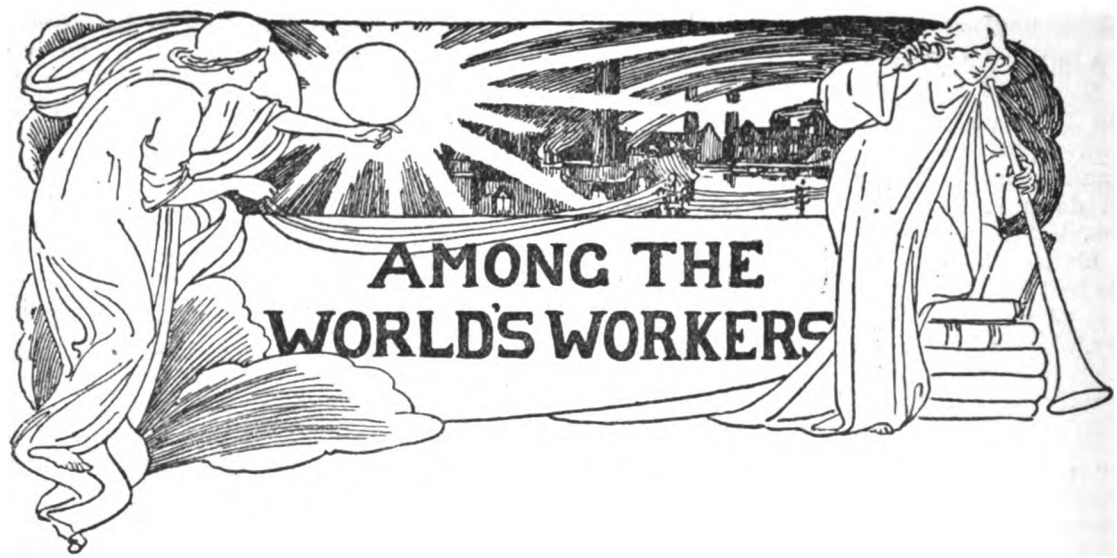

AN AUTOMATIC MACHINE FOR PACKING PARCELS

AN ingenious machine has been invented by M. Van Allen of Paris, for packing objects of various sizes, as satisfactorily as it could be done by hand, and much more rapidly. The machine first cuts the paper or any material in which the articles are to be packed. Then it forms this covering into the shape required, and presses the articles into as small a space as possible. It then closes the parcel, fastens up the ends and puts a label on to it. Forty parcels a minute can be made with this machine.

THE LIÈGE EXHIBITION

THE advantages Belgium offers to British commercial enterprise are described by Mr. Consul-General Hertslet in his annual report upon Belgian trade and commerce. He refers especially to the openings which should be taken advantage of by British manufacturers in connection with the exhibition to be held this year at Liège. "For example," he says, "there are now about 800 steam-engines running in connection with the seventy or more mines in the country. Many of these are old types, and there should be an opening for more economical engines. Inventors and manufacturers of mechanical substitutes for explosives in mines will find at the exhibition a good means of making their specialities known. There is also an opening for machine tools and other appliances in connection with the gunsmith's trade. Pneumatic tools are finding favour in this country, and might be worth exhibiting. The exhibition will also be worth the attention of boot and shoe-makers, especially if they will go a little out of their way to make special shapes for the Continental market. American boots find a ready sale, and there is no reason why British boots should not do so also. Manufacturers of jams, beers, whiskies and liqueurs may also find the exhibition a profitable means of advertising their goods."

ARTIFICIAL GUTTA-PERCHA

ACCORDING to the *Elektrotechnische Zeitung*, a chemist of Vienna, Herr Gentsch, has discovered a process for making artificial gutta-percha, which bids fair to rival the real thing at 35 per cent. less cost. The Gentsch gutta-percha is composed of india rubber and of the resin of the palm-tree. The artificial gutta-percha gets soft less quickly than the real, and its electrical resistance is slightly superior. In order to test the new discovery some cables of fifteen miles have been constructed from an island to the Continent, and the results were perfectly satisfactory. The only drawback hitherto found in the artificial gutta-percha is that, as it is more glutinous than the natural kind it is not easily welded, and a coating of india-rubber has to be used for this purpose.

CLOCKS REGULATED BY WIRELESS TELEGRAPHY

M. BIGOURDAN, of the French Academy of Sciences and Astronomer of the French Observatory, has been making experiments with wireless telegraphy, which have been most satisfactory. For the last twenty-five years Paris has had fifteen public clocks in different parts of the city connected by means of electricity with the Observatory clock, for the purpose of regulating the time according to the meridian. This system is costly on account of the laying of the wires, and beside the cost, its use is limited. M. Bigourdan has had recourse to wireless tele-

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graphy, and the signals given by this system could be received anywhere, even in private houses if required. The regulating clock at the Observatory operates an electric contact each second, works a relay, which in its turn sends a current into a primary circuit of an induction coil supplied with an oscillator. This circuit gives an oscillatory discharge of very short duration, which is regular each second. The two poles of the fine wire of the coil are then connected, the one with the ground and the other with a mast. By means of this mast the receivers of the electric wave beat with each second of the regulating clock. M. Bigourdan has tried two different receivers, the more simple one of which is a raido-telephone of the Popoff-Ducretet system. The second one was the receiver ordinarily used for wireless telegraphy. A chronograph band and pen have also been used by M. Bigourdan to replace the Morse receiver. With this chronograph which unrolls one centimetre of band a second, the signals are very clear, and the time every hour can be read within $\frac{2}{100}$ or $\frac{3}{100}$ of a second. The experiments were made at a distance of a mile and a quarter, and this could very well be greatly increased. As the waves of wireless telegraphy are diffused circularly like the waves produced by a stone on a sheet of water, all receivers within a given radius would get the time from the main clock. It is believed that this system will render great service in scientific research both in the calculating of longitudes and weights.

BRITISH TRAVELLERS WANTED IN CRETE

"THE principal reason of the falling off of British trade in Crete is the scarcity of British commercial travellers," says our Consul there. "Hardly a week passes without an Italian, German, or Austrian commerical traveller visiting even so small a place as Canea. Another reason for the falling off of British trade is that, whereas German, Italian, and Austrian houses give credit of three or even six months, British houses rarely give any credit. Italian, German, and Austrian houses also deliver goods f.o.b. to Canea, Candia, and Rethymo, insurance paid and risk taken by senders, whereas British firms will only deliver goods f.o.b. at some British port."

ADVERTISING IN MEXICO

THE recent opening of a Mexican information bureau in London lends interest to the remarks of our Consul in his latest report on the trade of that country. There is one point, he says, on which British firms doing business in Mexico show a neglect, and that is advertising. "Foreign firms advertise considerably in the tramways, railway stations, and in the public Press. Advertising pays in Mexico Mexicans like having anything that is the latest thing out. If you tell them so, constantly by drawing their attention everywhere available to your goods, they will want them, and will insist upon having them. This the Americans know and practice with good results. To new firms and the new enterprises that usually apply to Consulates for assistance I would say: Do not, in writing for information, withhold any important facts regarding your business, and remember to make your questions quite clear so that the Consul may know exactly the information that is wanted. Often add allied trades; quote whenever possible prices f.o.b. London or Liverpool; conditions; how packed, &c., terms of payment, discounts; and if any such information is not to be made public, then mark the letter confidential."

DOING FARM WORK BY ELECTRICITY

ELECTRICITY has at last been applied successfully to agriculture. Already, on farms in southern France, horses are replaced by motors. The farmers of the province of Aisne have discarded their horses and are threshing their grain, grinding their flour, cutting roots, and pumping water by electricity. The owners of large farms have their own motors. The smaller proprietors club together to buy a motor, which is moved from farm to farm as each farmer needs it.

The power to run the motors is supplied from a central station, over high-tension lines, to sixteen sub-stations, which distribute it at the proper pressure to the adjacent farms.

Other experiments have been made in Germany. The results show that it is cheaper for a small farmer to pay his share of the cost of a motor, which he may use when he wishes, than to keep a horse for farm work. And it has been found cheaper for the large farmer to own motors, which do his work quickly and with little care, than to maintain a large stable continuously.

An even more remarkable application of electricity is the use of an electric current to make plants grow. Experiments have been carried on at the Hatch Experiment Station at Amherst, Mass., which show that electricity has very marked effects on the growth of both seeds and plants. Seeds of several kinds of vegetables were planted in insulated boxes, where they were subjected to electrical currents of various kinds and intensities. The results showed that an alternating current of rather low intensity was the most effective stimulant, increasing the growth in some cases as much as 37 per cent. The use of atmospheric electricity, drawn to the soil by means of a pole surmounted by steel points—somewhat on the principle of a lightning-rod—made the seeds

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grow 55 per cent. faster than normally for the first forty-eight hours, 23 per cent. for seventy-two hours, and 17 per cent. for ninety-six hours.

It was also discovered that, where the seeds were treated with a positive charge of electricity, the growth of the roots was increased more than the growth of the tops of the plant; where a negative charge was used, the tops grew more. In raising lettuce, for example, a negative charge would be best; for radishes, a positive charge would be used.

The effects of electric lights at night on the growth of plants have been established by experiments made by Prof. L. H. Bailey of Cornell. He found that, by suspending an arc light above vegetables growing under glass, they were so affected as to grow much faster, maturing in the case of lettuce, from a week to ten days earlier than usual. The direct rays from the lamp injures most plants, if unshaded by glass. Commercial advantage has been taken of this discovery by W. W. Rawson, of Arlington, Mass., who has fifteen acres of lettuce and cucumbers under glass. He finds that it pays to light his garden.

BRITISH AND AMERICAN CONSULS COMPARED

THE comparison is drawn by Mr. Taylor, our Consul at Dunkirk, in concluding his report on the trade of that port for 1903. With some newspapers, he says, it has become the custom to attack the British Consul and to compare him unfavourably with his United States colleague. "These attacks," he continues, "in many instances, show a want of knowledge of the facts of the case. The writers are apparently unaware that British Consuls are chiefly appointed to ports where they have very important and onerous duties to perform in connection with the mercantile marine, a marine which contains half the tonnage of the world, and that at many ports his whole time is taken up in this work. A glance at the shipping-tables at the end of this report will show the preponderant position occupied by the British flag at Dunkirk, the third port of France, and where no vessel under the flag of the United States has entered for years. Many United States Consuls are placed at the chief inland industrial towns, and, owing to 'protection,' which requires Consular visés and certificates for all exports to their country, they are brought into intimate business relations with manufacturers and exporters which not only enables them to get information from the documents produced to them, but also to oblige in many ways, and therefore these gentlemen are naturally willing to oblige the Consul in return by giving him information and opportunities to obtain information. On the other hand the British Consul, owing to our 'free trade,' has practically no relations with manufacturers and merchants, except through the ordinary hospitalities and civilities of life, which the British Consul's pay does not allow him to offer to any great extent. If Consular (commercial) officers were appointed to the chief manufacturing and business towns, a large addition to the Consular Vote would be required. Would manufacturers and exporters, through their Chambers of Commerce or in some other way, be prepared to provide this money, or would it be a charge on the public purse? Even if these commercial appointments were made our commercial Consuls would always have greater difficulty in obtaining information than their United States colleagues, owing to the reasons stated above."

HOW AN INSECT AIDED A FRUIT-GROWING INDUSTRY

HERE is a curious story which comes from America of the importation of pollen-bearing insects for the propagation of a great fruit culture. In 1880, a San Francisco newspaper imported and distributed to its subscribers a large consignment of Smyrna fig-tree cuttings. Many of these cuttings were planted, and became fruit-bearing. But here a puzzling set-back discouraged the growers. While the trees bore fruit of some promise, not one fig on one tree grew to full size or ripened. Instead, they shrivelled up and dropped from the trees at about half their growth.

Government fruit experts were appealed to, and this curious fact was found: the Symrna fig is really only half a fig. That is, it is the female of a complete fig, for whose development it is necessary that it be fertilised with the pollen of the male, or Capri fig. This process of fertilisation requires a third and most interesting element—a little insect, known to science as the *Blastophaga grossorum*, and to the lay world as the fig wasp. This microscopic insect is born in the Capri fig, and at the proper stage of its development issues from its home through the little hole in the bottom of the fig, passing, in its exit, through the blossom, where its body is covered with pollen. Led by instinct the *Blastophaga* flies to the Smyrna fig and enters through the similar hole, where the Smyrna blossom catches the pollen from his body and is fertilised. From this stage the growth of the Smyrna fig to ripe maturity is only a matter of sun and days.

One large fig-grower had grown Capri- and Smyrna-trees, but had no fig wasps. Learning of the need of fertilisation to produce the Smyrna fig, he made some experiments in artificial fertilisation, using a wooden toothpick to introduce the Capri pollen into the Smyrna fruit. This experiment was so successful that he was convinced that, if he could use the means provided by nature for this purpose, he could make his

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orchard a commercial success. For several years from this time, he annually received through agents in Asia Minor, consignments of Capri figs containing the fig wasps; but, in every case, the insects had died in transit.

At last, however, in 1899, after eleven years of work, *Blastophaga* in some of his figs were alive, and were rapidly propagating their species. The following year, satisfied that he was near success, he made the journey of eight thousand miles to Asia Minor, and in the orchards of Smyrna spent several months, studying the methods employed by the original producers of the fruit.

He returned to California where his crop was in fine condition. Since 1901 the Smyrna figs have been successfully grown in central California, and the industry is growing as fast as the trees can be planted. By the work of a patient man and a patient insect a new and profitable industry has been created.

TWELVE THOUSAND MILLION MATCHES A YEAR

QUITE an event in the French industrial world is the adoption of the new match-manufacturing machine at the State factory of Aubervilliers, near Paris. A specimen of this machine was on view at the Exhibition of 1900, but several modifications and improvements have been judged necessary since then. At present the sixteen new machines which have been installed at the Aubervilliers factory will produce twelve thousand million matches a year.

It is now about fourteen years since the outcry was raised by the public with regard to the sufferings of the unfortunate match-makers. The French Government took the control of the factories in 1890, and war was waged with the terrible disease of necrosis. A better system of ventilation was introduced in the workshops, the use of white phosphorus was abolished, and a strict inspection of the factories instituted.

By employing these new automatic machines there will be no further danger for the workpeople.

The machine is supplied at one side with the small pieces of wood, and with sulphur, paraffin, and a paste of sesquisulphur, and at the opposite side with small wooden and cardboard boxes, which it fills automatically. The matches are carried along on a steel slab, bored with five rows of holes at equal distances. Each row has 110 holes, and the matches go through the various processes, and are finally packed into boxes containing a hundred. They pass through a bath of paraffin and sulphur, and then the heads pass through the layer of paste. When they are finished they fall five at a time into a cell and from that into the boxes.

A machine making forty-five strokes a minute produces, at the end of ten hours, 50,000 boxes of fifty matches, or fifteen million boxes a year.

Everything is done automatically with the exception of the alimentation of the machine. For this two workwomen are sufficient, but a third is employed for each machine. The duty of the third is merely to examine and arrange the boxes as they are complete.

With the old process of match-making twenty men and women were employed to turn out this same amount of work, and the quality of the matches depended largely on the skill and experience of the workpeople.

JAPANESE SKILL IN THERAPEUTICS

AT the International Congress of military medicine, special mention was made of the great progress made by the Japanese in surgery and therapeutics. One of the doctors present declared that no nation had proved itself so skilful, during a war, in the medical art. It is an acknowledged fact that Manchuria is a most unhealthy country, but the Japanese were quite prepared for this, and took such precautions with regard to all sanitary arrangements, that their deaths from illness have only averaged 1 per cent., whilst during a war the statistics generally show that four soldiers succumb to illness to each one killed on the battlefield or mortally wounded. The Japanese health inspector is always present during active service. He watches over everything, and one of his principal duties is to see that the soldiers do not drink contaminated water. He also impresses them with the importance of sobriety and cleanliness.

LITERATURE IN JAPAN

MORE than a thousand newspapers and reviews are published in Japan. In the public library of Tokio there are more than five hundred thousand volumes, a thousand of which are in European languages. When the Japanese translate books they frequently take the most astounding liberty with the text. Many of the episodes are completely changed so that they may be in accordance with the customs of their own country, and very frequently the personages receive Japanese names. When Sada Yacco played *La Dame aux Camélias* in Paris, the translation was so different from the French version that it is doubtful whether Dumas would have recognised it.

THE PROGRESS OF CO-OPERATIVE SOCIETIES

IN one of the Spanish reviews M. Albornos writes a long article on the subject of Co-operative Societies, their progress and their future. In England he tells us there are 1,893,000 members of such associations. In the year 1848, there did not exist a single society of this kind

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in France, and, at present, there are 1650 with 400,000 members. In Germany there are 1500 Co-operative stores, in Switzerland 532, and in Belgium 400. M. Albornos points out the great services co-operation has rendered to the working classes, and he goes on to prove that with the progress of such a system the middle-man will finally cease to exist, and future society become an immense federation of associations of this kind.

A NEW USE FOR RADIUM

DR. LONDON of St. Petersburg, has observed that the properties of radium can be communicated to wool, and consequently to all materials made of wool. He, therefore, argues that clothes might be made which should be raidiographic, and, therefore, excellent for persons to wear who are suffering with certain skin diseases. This "emanated" wool could be used regularly as a pharmaceutical product and would not be costly, as it requires so small a quantity of radium to give the wool radioactive properties.

WHERE NOT TO GO

IF there are places in Brazil where colonists might do well, the American Consul at Para does not know of them. With stories of discouragement and despair, stories of failure and disaster, he says, he is all too familiar. "I shall not willingly add one single victim more to the long list of disappointed seekers after the tropical Eldorado."

"No Wealth on the Amazon" is the text of the Consul's warning. He does not say that the acquisition of a fortune or a competence is difficult, doubtful, or impossible on the banks of the mighty Amazon; he does say that such a miserable existence as would disgust a Digger Indian would be hardly obtainable by one man in ten thousand of such as are thinking of going there.

"There are in the whole vast length of the Amazon [continues Mr. Aymé], two real markets —Manaos and Para. There are a few straggling villages and occasional Indian huts. The inhabitants of huts and villages are not possible consumers of anything the colonist might produce. I asked one man in Manaos, who is thoroughly and practically acquainted with the possibilities of cattle-raising in northern Brazil, whether he thought young men with small capital could do anything in cattle-raising on the Amazon anywhere. He replied that it would be criminal to permit any young man with money and energy to come and find the grave of both on the banks of the Amazon. In these extraordinary forests there are found some of the most beautiful and valuable woods in the world, as well as fruits, nuts, oils, balsams, and gums, but—and this BUT, is unsurmountable—they are found as rarely as diamonds in the gravel or gold nuggets in the streams. There is a false impression existing that rubber trees, ebony, rosewood, and all the rest are found in great groves or clusters, like our pine or oak forests. The fact is that these trees are solitary. When two of them are only a quarter of a mile apart (and remember that the quarter-mile is not open space, but thick-matted, almost impenetrable swamp forest) they are considered close together; if they are a mile apart they are not considered to be very far distant from each other. Nor does this huge forest produce any great quantity of food for human beings. The staple articles of food for the dweller on the Amazon is dried pirarucu, a huge, fat river fish, and 'farinha,' the starch of the manioc root.

"Grant that the colonist could get land, grant that he could raise vegetables, grant that he could raise cattle, grant that he could find, cut, and haul to the river-brink valuable cabinet woods—and I assert that he can do none of these things—grant that he could do them all; grant that he spoke Portuguese fluently, grant that he had become instantly acclimatised; grant all this and more, he would then be confronted with the problem of where to find a market for his products. Let him believe that the men who have lived here so long would supply such as are wanted in the world's markets could it be done; but the expense of taking them to such markets would be many times the value of the products themselves. A market here? No. The markets of Manaos and Para are very small and are fully supplied by native capital."

A SPANISH INDUSTRIAL ENTERPRISE

AN overhead line is being constructed in Spain for the transport of iron ore direct to the boats. The length of the line is about twelve miles starting from Culativi at an altitude of about 4000 ft. above sea-level, and ending at Casa-Fuerte. The cost of construction has been about £32,000, but it is calculated that the mines for which it has been undertaken, contain at least a million tons of hematite with 52 per cent. of iron, and 4 per cent. of manganese.

REMARKABLE AGRICULTURAL INNOVATIONS

IN a long article by M. Roux, in *La Revue*, we are told of some marvellous agricultural innovations by two scientists, Professor Hopkins and Professor Shamel. After a series of experiments and six years of uninterrupted study and work, they have succeeded in cultivating maize by scientific methods, so that at present

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it can be used for an incredible number of purposes. It can now be grown with short or long ears, the plant may be tall, or quite short with larger leaves. It is used for making starch, bread, and maize-oil, and is now being largely imported into Europe for the latter purpose. The plantations on which it is grown are specially prepared according to the kind of maize required. Some of this new species of maize yields a net profit of £8 an acre. Thanks to this new cultivation, maize is now employed in various industries for which it has hitherto not been appropriate. It appears that it will prevent ships from sinking when struck by cannon balls or other projectiles of war. The marrow of the ear, a substance chiefly composed of cellulose, is subjected to a certain process, and if then placed between the two iron plates of the vessel the projectile enters this wall of condensed cellulose, which then closes up so that no harm is done to the interior of the boat. This cellulose of maize is also used in the manufacture of paper in the place of pulp of wood, five different kinds of starch are made from it, and it is also being used for pastry.

It is, however, the oil manufacturers who will probably reap the greatest benefit from the innovations of Messrs. Hopkins and Shamel.

Sugar, too, is being made from it, and a new vulcanised india-rubber manufactured with maize-oil and rubber. The maize leaves are used for mattresses and the stigma is employed for pharmaceutical purposes. The ears when emptied of the grain can be employed as a combustible, three tons equalling a ton of coal, and the ashes furnish an excellent quality of potash.

A NEW PLANET

IT is announced that Herr Max Wolf, Director of the Observatory on the Königsstuhl, near Heidelberg, has discovered, by means of celestial photography, a new planet of the thirteenth size.

CENTRAL ITALY AS A BRITISH CUSTOMER

A WORD of encouragement to British manufacturers comes from the Consul representing their interests in Central Italy. For particular guidance and information, application can now be made to the recently established British Chamber of Commerce for Italy at Genoa. The two special openings for increased British trade are the demand for motor fittings in Rome, and rolling-stock for the proposed new railways. With regard to these Mr. Consul C. C. Morgan says: "The number of motor-cars in Rome is increasing, and I consider, therefore, that a good local agency for the sale of British motor fittings, tyres, &c., would do a remunerative business. The greater interest taken by speculators and by the public generally in the industrial and agricultural development of Central Italy has encouraged the provincial and communal authorities to grant subsidies to the builders of new railway lines intended to supersede the present obsolete and tardy means of conveyance. Several railway projects have been put forward during recent years. The building of the proposed new lines will necessitate a fairly large importation of unwrought metal, and of rolling-stock, and, when the times comes, British exporters might keep a look-out for tenders for the supply of the above goods." He also strongly advocates that a larger number of commercial travellers should extend their visits to Central Italy, where they would doubtless benefit by increased orders of a substantial kind.

SHALLOW PLOUGHING IN RUSSIA

THE British Vice-Consul in Odessa gives an interesting account of experiments in shallow ploughing in that district. This system has been effectively adopted as a defence against the frequently recurring droughts which are such a serious drawback to agriculture there. In describing the method introduced by Mr. Ovsinsky, he says: The main object of his method is to utilise the supply of moisture which may have accumulated in the subsoil during the winter months, and so to be less dependent on the uncertain rainfall of the spring. It consists in turning up the soil to a depth of about 2 in. only, instead of ploughing in the ordinary way some 7 or 8 in. deep. The moisture which escapes under the usual system is thus retained beneath the surface ploughed. A further feature is that special corn-drills are used, and strips of a width of 20 centims. (8 in.) are sown as thickly as possible. Between each strip sewn is left an unsown strip of equal width, which is kept perfectly clear and free from weeds, and this enables both light and air to reach the sowings. It is said that where this plan is adopted each grain of corn produces one ear only, but of superlative growth. A large landowner in North Bessarabia has tried the system with signal success, and this year he anticipates the very large yield of 48 cwts. per acre, unless heavy rain falls and beats down his standing corn. He claims that his wheat is now showing far superior results to that of his neighbours. It should, however, be noted that his estate does not lie in those parts of the province where the harvest outlook is now the most gloomy. Further experiments are to be tried by Mr. Ovsinsky on an area of about 800 acres in North Bessarabia, which has been purchased by six landowners and placed at his disposal for the purpose. The weak point of the system is that it requires the greatest accuracy if the best results are to be obtained, and it is, therefore, quite unsuitable for peasant cultivation, and, indeed, is unlikely

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to be successful if adopted by the ordinary small Russian landowner, who scarcely possesses the requisite scientific equipment.

A SCIENTIFIC SCHOOLMASTER FOR LONDON

DR. Frederic Rose, the British Consul at Stuttgart, whose admirable reports upon German educational methods have made his name known to all who follow the education movement in this country, has been appointed assistant Educational Adviser to the London County Council. The selection is a splendid one, upon which London is to be congratulated. Dr. Rose will have a great opportunity. As the *Daily News* puts it, never did 5,000,000 people more need the scientific schoolmaster.

COAL FIRES AND FOG

FOLLOWING up the article in the November WORLD'S WORK on Sir Oliver Lodge's proposals for dispelling fog by driving electricity at a very high voltage through barbed wires into the fog-filled atmosphere, the *Pall Mall Gazette* has published an interesting interview with Sir Oliver concerning the prevention of fogs.

"The chief sinner," he said, "the primary cause of town fogs, is the open grate, and I would, if it were possible, prohibit the use of crude coal in cities, towns, and other thickly populated districts. We should then have none of these terrible fogs." He admitted that it might be difficult to persuade the British householder to go without his coal fire, but he would substitute gas for coal as a heating and cooking agent, and electricity as an illuminant and as a substitute for a large proportion of the present steam power employed. And he is quite confident that such substitution can be made economically sound, in addition to its enormous bearing on the health of the people.

"What we want is gas of a lower strength, a lower calorific value, than the present coal gas, and it should not be made in the towns where it is consumed if it can be avoided. The gas should be made where possible, at the mouth of the coal pit, thus saving at the outset all the cost of the carriage of coal, and carried by large mains to the consumer. Being of a relatively low force, the pressure would be less than that of the present illuminating gas, and I see no reason why such gas could not be safely and economically carried for twenty miles or more, without loss." The production at the pit's mouth was not, he admitted, an absolute essential of his idea, but he regarded it as very desirable.

"And do you think," asked the interviewer, "that this provision can be made at a cost to compete with that of crude coal?" "Yes," he replied, "gas of this quality it should be possible to make and deliver at a cost of sixpence per thousand cubic feet, and it would be sufficient for heating and cooking. If it was desired to use it as an illuminant it could be enriched by the use of hydro-carbon oils, as is done now with water gas, and the use of mantles would also help to increase its illuminating power."

The interviewer mentioned, as an illustration of this idea, the Mond gas, which it is proposed to distribute, from a central manufactory, over the greater part of Staffordshire.

"No, not exactly," Sir Oliver Lodge rejoined, "because that gas, excellent as it may be for its special purpose, has only one-third the calorific value of coal gas, and what we want is something between the two. The raising of the loadline of distribution would reduce the cost of production and distribution, and I am convinced that when the housewife is assured that the use of gas is cheaper than coal it will not take long to convince her of its greater cleanliness and healthiness. Why," and he pointed to the comfortable coal fire in his study, "people who complain of gas fires and that they don't like them, don't realise that that is a gas fire, making its own gas and very imperfectly consuming it. Electricity should be the main illuminant, but gas might be used, as now, where electricity may be difficult to introduce. With a more steady and regular consumption the price of both gas and electricity will decline."

Sir Oliver Lodge is an authority on coal-stoking, and a guiding question drew him on to that aspect of the matter. "Stoking is a fine art," he said, "and you will never get it observed with the kitchen grate. It may be possible, in the course of time, to devise a kitchen grate with more complete powers of combustion, but you will never get the fires properly stoked. The secret of stoking is 'little and often,' and the fuel should be renewed from the bottom or the centre of the fire, whereas with the open grate the fire is allowed to go low, then a great load of coals is dumped on the top, and away it goes pouring out black smoke and no heat for long enough."

Another method which Sir Oliver Lodge has in mind for the production of cheap gas is an adaptation of the Belgian coke-ovens. In coke manufacture in this country the gas is wasted, whereas it might be saved and utilised. In the course of further conversation, he drew my attention to the extreme blindness of the British people towards the terrible expense of their fogs. "They will not see that it costs a terrible amount, in waste and misuse, to make the fog, in addition to the cost of dealing with it when it has been created. I hope the method I designed for sea fogs, and have imperfectly tried at Liverpool, may be found a practical palliative of town fogs, but it can never be anything more. The only possible final solution of the problem is to abolish the use of coal and substitute for it gas for domestic purposes."

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A CITY WITHOUT A SLUM

THIRTY-TWO miles from London is the pleasant little town of Hitchin, famous for its ancient market and hostelries, and now becoming popular as a residential and educational centre. A fast non-stopping train on the G.N.R. main line will get you there in about forty-two minutes, or in about the same time as it takes to reach the average London suburb. Quite a host of London workers live in Hitchin and enjoy the travelling up and down every day. It is near this quiet and interesting little town that a great social experiment is being tried, and an effort is being made to create a "City without a Slum."

Two miles' ride on the Garden City 'bus from Hitchin Junction takes you uphill to the Estate Office of the First Garden City, Limited, at Letchworth. Rising to an altitude of 300 ft. you look down on the mists in the valleys and feel the bracing effect of the clear air. And yet there is nothing bleak about this fine country, with its splendid timber and green pastures. Here is the site on which it is proposed to erect a town of 30,000 inhabitants with the object of providing an object-lesson in housing and other social reforms.

It is now fifteen months since First Garden City, Limited, was formed with a capital of £300,000—of which £100,000 has been raised by the issue of a semi-private prospectus—including £20,000 previously subscribed to the Pioneer Company. The Directors of the present Company are: Ralph Neville, K.C.; The Right Hon. Lord Brassey, K.C.B.; Edward Cadbury; Henry Blackwall Harris; Ebenezer Howard; T. H. W. Idris, J.P., L.C.C.; Howard D. Pearsall, M.Inst.C.E.; Thomas Purvis Ritzema, J.P.; Franklin Thomasson, J.P.; Aneurin Williams; and among the leading shareholders are such well-known names as the following: Sir Alfred Harmsworth; George Cadbury; W. H. Lever; C. D. Rose, M.P.; Viscount Ridley; Viscount Howick; R. L. Barclay; R. B. Martin, M.P.; Anthony Hope; Richard Whiteing; H. G. Wells; Viscount Ebrington.

The tendency of manufacturers to move out of cities is one of the great factors on which the promoters of the scheme rely for creating the new city. The pressure of rates and rents in London and other large cities has become most severe, and manufacturers will welcome a scheme under which they can move out with the least amount of difficulty. Already six firms have decided to take sites in Garden City; these are The Garden City Press, Ltd., Printers, Hitchin; Heatly Gresham Engineering Co., London; A. Wilme Collier, Stationery Manufacturer, London; Idris and Co., Ltd., Mineral Water Manufacturers, London; Ewart and Co., Geyser Manufacturers, London; Vickers and Field, Asphalte Manufacturers, London. Four of these propose to have their buildings erected and their works begun within the next six months.

Sites for 300 houses have been selected; a considerable number have already been erected, and about fifteen are occupied. Ample re-

HIGH STREET, HITCHIN, SHOWING GRAMMAR SCHOOL

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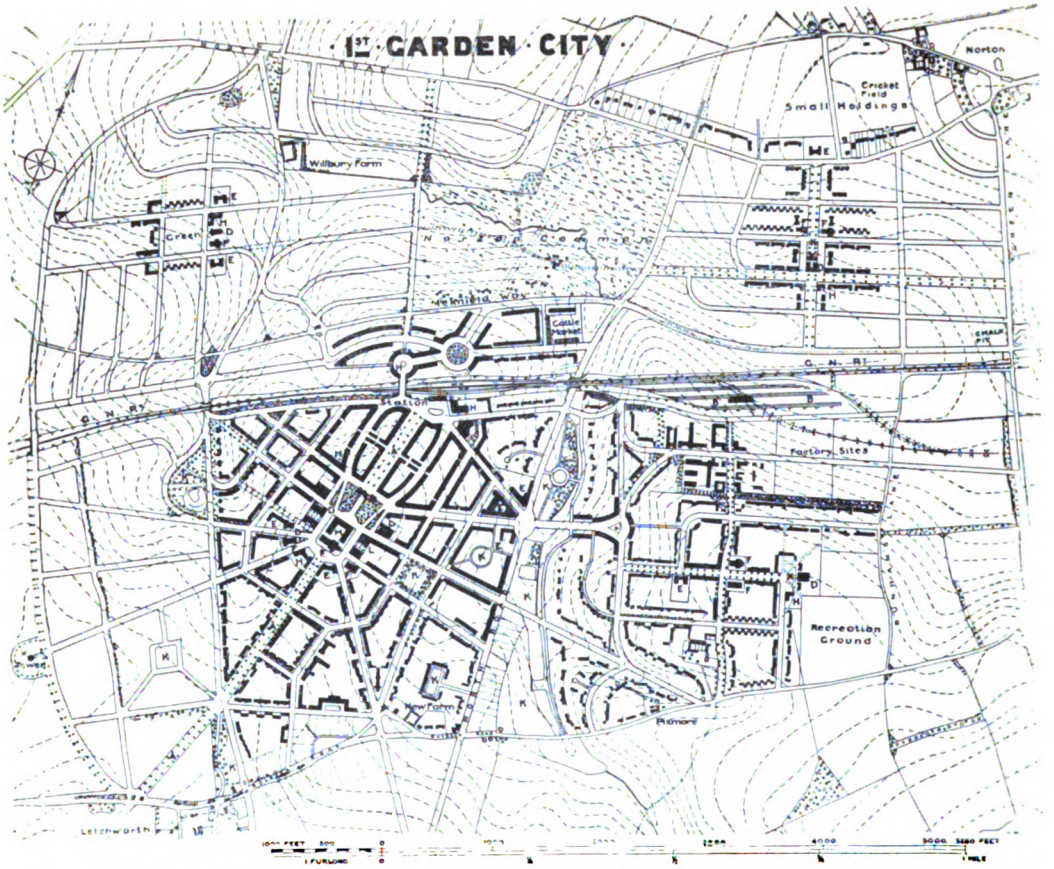

PLAN SHOWING DEVELOPMENT OF TOWN AREA—ABOUT 1000 ACRES. A COLOURED KEY PLAN CAN BE OBTAINED FROM THE SECRETARY OF FIRST GARDEN CITY, LIMITED

creation and garden space will be provided, including a golf course which is being laid out. Not more than ten houses will be allowed on an acre.

Up to the present, there has been no effort to rapidly push forward with building operations. The water-supply and sewerage schemes are only now completed, and temporary arrangements have had to be made at some expense to the Company, in connection with buildings already erected. From two to three miles of road are now nearly constructed and other works are in progress. Altogether the Company is spending about £25,000 in the immediate development of its Estate and in providing the facilities necessary for an urban population.

The Estate consists of 3818 acres, and of this area about 1200 acres will be occupied by the town portion, 2600 acres being reserved permanently for agriculture. After the completion of purchase in September 1903 the plan of the town had to be prepared, and four months were employed in having this carefully done. Since then the development has proceeded with astonishing rapidity, and the Directors will be ready to make substantial progress during the coming summer.

It is remarkable testimony to the growing public spirit of England that £100,000 has already been raised for this venture in spite of the fact that the dividends are to be limited to 5 per cent. per annum. Any profit made beyond this will be expended for the benefit of the town and its inhabitants. Thus, the latter will have the satisfaction of knowing that the increment of value of the land created by themselves will be devoted to their own benefit.

The advantages claimed for the scheme are that hygienic conditions of life will be provided for a considerable working population, agriculture will be benefited by a market being brought to the farmer's door, and by the relief of the tedium of agricultural life due to accessibility to a large town.

From the prospectus we quote:

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"The Directors feel sure that the First Garden City will complete the proof (already in part furnished by such experiments as that of Messrs. Cadbury at Bournville and Messrs. Lever Bros. at Port Sunlight) that such an undertaking is feasible and provides a safe investment for capital at a reasonable rate of interest. When this has been done the Housing Question will be in process of rapid solution by the multiplication of settlements on similar lines to 'First Garden City.'"

The Estate cost about £154,000, or rather over £40 per acre; this including buildings which have been valued for insurance purposes by H. Trustram Eve, F.S.I., at about £84,000. The property also includes a large amount of timber and such natural resources as chalk, gravel, sand, &c., which are of considerable value to the Company.

The land will be let on lease either for ninety-nine years with the reversion going to the Company for the benefit of the community, or for 999 years with revisions of rental every ten years. The latter revision would be made by a valuer mutually agreed upon, and would be estimated apart from the tenants' improvements.

The rentals now being obtained show a fair profit to the Company after allowing for all cost of development and other expenses, and, as soon as the first part of the town has been developed, it will, of course, be possible to secure substantial increase in these rentals.

Such are the facts which one may gather from a consideration of this unique undertaking; and when they are made real by a view of the actual site and the operations which are going on they become of much greater interest. Cheap railway tickets available between King's Cross and Hitchin are obtainable at the London office of the Garden City Company at 344 to 351 Birkbeck Bank Chambers. Those who are interested in the scheme should lose no time in placing themselves in communication with the Secretary, and all who wish to see an object-lesson which will be of immense national benefit, should consider the question of giving the scheme financial support. Too much cannot be subscribed to such a movement. It aims at coping with an evil of enormous and rapidly growing proportions, and it cannot, therefore, be too largely supported or too quickly accelerated. Those who wish to take shares in the Company will be able to get a prospectus from the Secretary at the above address.

NORTON VILLAGE

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AN EXHIBITION OF CHEAP COTTAGES

THE Proprietors of *The County Gentleman* have originated the idea of holding an Exhibition of Cheap Cottages with the object of demonstrating what is the best cottage that can be built for £150. The scheme has attracted to itself influential support, and arrangements have been made to hold the Exhibition on the Garden City Estate at Letchworth, during July and September of this year. The Garden City Company will lend the land for the Exhibition, and will assist in the sale of cottages of approved design. In this way the buildings will not be destroyed when the Exhibition is over, and builders of cottages will be able to advertise their methods without much expense to themselves.

The Exhibition will be of a national character, and samples of cottages suitable to various localities in Great Britain will be invited. It is also hoped that exhibits will be obtained from the different Colonial Departments and from some of the continental countries interested in housing. The Bournville Village Trust and several manufacturers have decided to take part in the Exhibition, and Earl Grey, before his departure to Canada, promised to advise the Canadian Government to erect a model set of farm buildings, in which the chief feature would be a cheap cottage.

Subsidiary to the main Exhibition it is proposed to have an Exhibition of photographs, drawings, and paintings of cottages and of examples of town development throughout the world; also exhibits from Guilds of Handicraft, fittings and furniture suitable for small cottages; models and designs of buildings for small holdings; designs for cottage gardens; and plans and reports of Social, Economic, Co-operative, Educational and other societies. The principal feature will be an Exhibition of all appliances which are presumed to cheapen cottage property, and an effort will be made to demonstrate the value of village industries and agricultural organisation.

Executive Committee

An Executive Committee has been formed to undertake the management of the Exhibition and consists of the following representative gentlemen: Mr. J. St. Loe Strachey (Chairman); Mr. Thomas Adams (Secretary and Manager, First Garden City, Limited); Mr. J. H. Barlow (Secretary Bournville Village Trust); Mr. P. C. Burton (Manager *County Gentleman*); Mr. Andrew Caird; Mr. Albert E. Cave (Editor, *Municipal Journal*); Councillor J. Cornes; Mr. William Crooks, M.P.; Percy L. Parker; Capt. Godsal; Mr. G. Montagu Harris; Mr. F. W. Pethwick Lawrence; Mr. A. H. H. Matthews (Secretary Central Chamber of Agriculture); Mr. Ralph Nickson (Port Sunlight); Mr. Robertson Scott; Mr. Henry Vivian (Secretary Labour Co-partnership Association); Mr. Arthur Webb (Secretary Co-operative Permanent Building Society).

Distinguished Patrons

Among other distinguished ladies and gentlemen who have consented to become Patrons of the Exhibition are the following: His Grace the Duke of Devonshire; Lord Avebury; Mr. L. A. Atherley-Jones, K.C., M.P.; Mr. Sidney Buxton, M.P.; The Rt. Hon. Lord Brassey; Sir Wm. Chance, Bart.; Mr. Edward Cadbury; Mr. A. H. Clough; Lord Ducie; Mr. E. H. Darwin, F.R.S.; Mr. H. Rider Haggard; The Lord Bishop of Hereford; Sir Alfred Harmsworth, Bart.; Lord Henleaze; Mr. H. B. Harris; Mr. Ebenezer Howard; Mr. T. H. W. Idris, J.P., L.C.C.; Mr. Rudyard Kipling; Mr. Arthur Lee, M.P. (Secretary Admiralty); Mr. W. H. Lever; Mr. Ralph Neville, K.C.; Mr. E. G. Pretyman, M.P.; Mr. H. D. Pearsall; Mr. R. A. Reed; Mr. T. P. Ritzema, J.P.; Sir Edward Strachey, Bart.; Sir Hugh Shaw-Stewart, Bart., M.P.; Mr. E. D. Till; Lady Wantage; Alderman Winfrey, and Mr. Aneurin Williams.

Subscriptions

The Prize Fund has been opened with a subscription of £100 from the Proprietors of *The County Gentleman*, and the organising Fund is headed by the Duke of Devonshire, with a subscription of a similar amount. Those interested in the Exhibition or who desire to subscribe to its funds can obtain further information by communicating either with the Manager of *The County Gentleman*, Wellington Street, Strand, London, W.C., or with the Secretary of First Garden City, Limited, 344-351 Birkbeck Bank Chambers, London, W.C.

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A GREAT EDUCATIONAL COLLEGE

WHILE what may be called the moral conditions of success in a commercial career remain essentially the same as they have ever been, the intellectual qualifications are widely different from those which were sufficient two decades ago. "Sterling honesty of purpose" no longer suffices to carry the man of commerce to the top of the smallest of trees. Sad it may be, but it is terribly true that the manufacturer who hugs the belief that he has but to produce better goods than his rivals to win fortune, finds sooner or later that he has a delusion for his bedfellow, and, for his sole reward, a consciousness of virtue. In commerce, to put it mildly, modesty is at a discount, and he who has good wares to sell must proclaim their merits from the housetops. His light must shine through a very transparent bushel, endowed, too, with magnifying qualities. Advertisement Advertisement, and again Advertisement is the cry of the modern, and a new profession has been created to tune the cry, that of the Advertising Expert. It has been realised that mere noise is not sufficient. The public ear must be tickled, the public eye skilfully magnetised to direct itself where its gaze is wanted. The field of employment is practically illimitable, every advertising expert aiding to enlarge the field for the employment of his brotherhood.

One of the largest educational establishments in London has grasped this fact, and is about to publish a text-book dealing with the subject from every standpoint.* It is claimed that the business man who has digested this book will have acquired a good working acquaintance with the whole art of advertising, and a recital of the titles of the leading chapters certainly seems to justify the boast of the publishers. Here they are: Composition and Style in writing Advertisements; Technical Proof and Press Corrections; Blocks—Various Processes; Type and Borders; Topical Advertising; Local Advertising; Newspaper Advertising; Magazine Advertising; Public Vehicle Advertising; Circularising; Poster Advertising; Paper—How to judge it—Prices; Printing—Trade Secrets; Opinions of the largest English and American Advertisers; Ad.-Schools; Advertising Agents—their uses and limitations.

The price of the book, the somewhat inadequate title of which is *Money-Making by Ad.-Writing*, is only five shillings, and the publishers are Messrs. Neuman and Castaréde, of 71 High Holborn, London, W.C., the publishing department of the School referred to above, that of Messrs. Hatchard and Castaréde, of the same address. The principal chapters will be written by some of the largest firms in the country carrying on the various departments of Publicity treated of, those of a general character being furnished by the principals of the School, their qualification for their task being the establishment, within a short space of time, of an enormous concern, by advertising. Those who have succeeded may claim to speak with authority, and a history of their undertaking will be the best voucher for the stability of the foundation of the building to which this latest enterprise has been added as the highest stone.

A Short Story of Success

A few years ago a young man who had taught Sloan-Duployan Shorthand with some degree of success, in a provincial town, determined to migrate to London and there carve out a career for himself.

None but those who have themselves yielded to the fascination of the Great City and left the humdrum life of the provinces to tempt fortune in the fierce struggle of competition in the Metropolis, can fully realise the mingling of hopes and fears, the alternate feelings of elation and depression, which are experienced by the

* *Money-Making by Ad.-Writing.* Crown 8vo, cloth, 5*s.*, post free. Neuman and Castaréde, 71 High Holborn, London.

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young man who has finally resolved to put forth from the quiet haven of country life and venture alone on the wide and unknown

MR. F. HARVEY HATCHARD

sea of life in London in search of name and position.

Mr. Hatchard, the young man referred to, was able, through the instrumentality of Mr. Sloan, the author of the Sloan-Duployan system, to obtain a share in a tiny room in Fleet Street as an Office; and in this room he set himself with all diligence to the task of recruiting students.

Only professional men, such as doctors, schoolmasters, professors of languages, &c., know how difficult is the task of establishing oneself in a new district and obtaining a *clientèle*, how dreary and irksome is the long waiting for clients who are all too slow in making their appearance.

So it was with Mr. Hatchard. The small barely furnished office involved an outlay of but a few shillings a week, but even this small outlay meant a great deal to him, with the modest means at his disposal.

At last, however, a few students came, among them being a young man who already knew something of the Sloan-Duployan system, and wished to be coached to a satisfactory speed in a fortnight. Mr. Hatchard gladly undertook and succeeded in this task, and, at the same time, struck up a friendship with the stranger, who, in the course of conversation, made several suggestions for the improvement of the business.

One of the first suggestions was the removal of the Institute to more congenial surroundings, and, as soon as the opportunity presented itself, a share in a better-appointed office on Ludgate Hill was acquired, and the change was justified by an immediate increase in the number of students.

Mr. Hatchard's new friend made a practice of dropping in every evening, and from chatting he gradually drifted into helping in the work of the school. Impressed by his former student's resourcefulness and enterprise, the originality of his suggestions, and the uniform success which followed on their adoption, Mr. Hatchard finally proposed a partnership on business lines, and the firm of Hatchard and Castaréde was the result.

It soon became necessary to obtain still larger premises. An office was secured in one of the largest buildings in London, the Birkbeck Bank Chambers, and, for a time, this was found sufficient.

It was then decided to add *Postal Tuition* in Shorthand to the personal, private, and

MR. LEON DE CASTARÉDE

class teaching, and a course of lessons was organised and advertised fairly widely.

The innovation succeeded beyond all hopes. Students were booked, not only all over the

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United Kingdom, but in the Colonies all over the world. The recommendations of satisfied students brought in others, until the business assumed colossal proportions.

Here is a fair example of what the Sloan-Duployan system accomplishes:

On October 16, 1902, Miss Florence M. Dunham, of "Hillside," Hatfield, commenced the study of Sloan-Duployan Shorthand, and after taking eleven lessons only, was examined by Lord William Cecil (Rector of Hatfield) on December 12, 1902, who certified that Miss Dunham wrote at the rate of 109 words per minute for three consecutive minutes, afterwards transcribing the notes "without hesitation or mistake."

The above facts are vouched for in a statutory declaration made at Hatfield on December 22, 1902, before Colonel R. B. Fellows, J.P. for Herts, and demonstrate in the most forcible manner the chief characteristics of the Sloan-Duployan system:

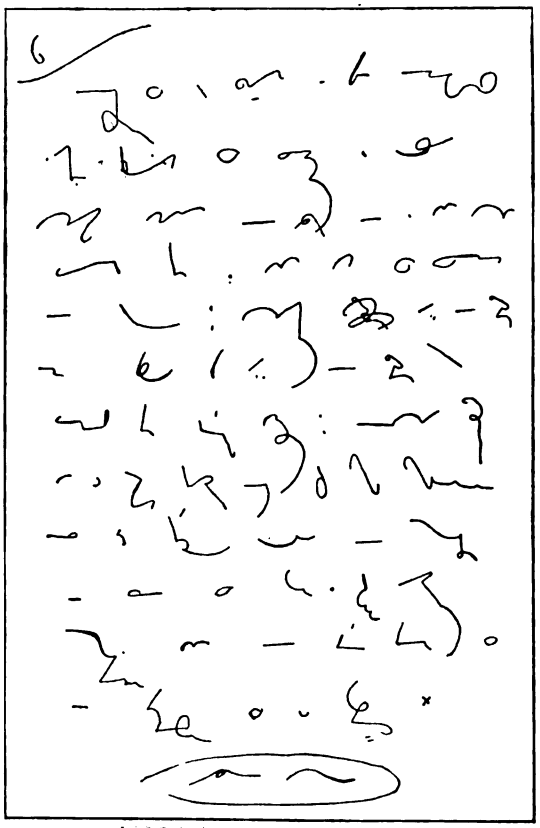
SIMPLICITY: Acquired in eleven lessons.
LEGIBILITY: Notes transcribed "without hesitation or mistake."
SPEED : 109 words per minute in eight weeks.

The next important step taken was the extension of the curriculum to include tuition in French and Book-keeping. An able and highly accomplished professor was engaged for private and postal tuition in the former subject, and courses of instruction in Book-keeping were commenced by a brother of Mr. Hatchard, a specialist in the teaching of this subject.

Many students were booked for both subjects and the success of the experiment was not for a moment in doubt.

Soon afterwards a favourable opportunity offered of securing the services of a successful London journalist, Mr. A. Barnard, for the tuition of pupils in all branches of Journalism. Many students were enrolled and the Correspondence classes in this fascinating subject were soon in full swing.

With these extensions of the scope of the Institute it was speedily found that the office in Birkbeck Bank Chambers was far too small,



FACSIMILE OF NOTES OF MR. GLADSTONE'S OFFICIAL STENOGRAPHER

From a speech made at Norwich, May 16, 1890. Taken from the original note-book of Mr. James Duncan, twenty-one years of age, a writer of Sloan-Duployan, and the youngest reporter in the "Gallery," House of Commons. He accompanied Mr. Gladstone on his famous East Anglian Tour, and reported all his speeches verbatim

and a lease was taken of more commodious premises at 71 High Holborn, the present address of the Institute.

A "CIVIL SERVICE" BRANCH

But even this does not exhaust the tale of the activity of this remarkable firm. For some time many inquiries have been received from persons wishing to be coached for the different examinations of the Civil Service Commissioners. Messrs. Hatchard and Castaréde have accordingly engaged a staff of capable and experienced tutors for conducting courses of preparation for all Civil Service and similar examinations by correspondence, at the lowest fees compatible with their principle of giving the most

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THREE NATIVE CLERKS

Attached to the Ashanti Gold-fields (Auxiliary) Mining Company conducting operations on the West Coast of Africa, who joined the postal classes in February 1904. Exercises were sent out at regular intervals, and in April of the same year, seven weeks from first commencing the study, and after completing the first half of the system, they were duly examined by the General Manager of the Company in question, when it was found that they were capable of writing from dictation a fairly difficult test, consisting of 220 words, in four minutes, transcribing the same without difficulty

thorough and careful individual tuition to each pupil. Students are already being enrolled for these courses, and signs are not wanting that this Department will, ere long, become one of the most prosperous and important of the firm's undertakings.

The advantages of Civil Service employment are too well known to need recapitulating here. Briefly set forth, they are Permanent Employment, Sick Pay, and Retiring Pensions. The lives of civil servants are not wholly devoted to official routine. Most of them have some hobby or other, and a large proportion have solved the problem of how to make their hobbies pay. Many dabble in journalism, the "London Letters" of many provincial newspapers being the work of civil servants. Others, more ambitious, devote themselves to fiction or to the higher branches of literature. The position of Dramatic Critic to the *Times* is filled by a civil servant. The successful novelist, Mr. W. W. Jacobs, and the perhaps equally gifted black-and-white artist, Mr. Will Owen, were, until recently, both in the Civil Service. Many secretaryships in well-known clubs and other institutions are held by civil servants.

The Institute at 71 High Holborn, which commenced on such a modest scale, now has a staff of teachers and assistants numbering over twenty.

The secrets of the success of Messrs. Hatchard and Castaréde are simple enough: (1) Ceaseless activity and devotion to the interests of students; (2) Enterprise; (3) Organising ability; (4) Advertising.

Advertising comes last, but is primarily responsible for the success of the enterprise. For the possession of the best qualities is of little service if the world is not informed, and persistently, of their fruits. It is the buried talent which is unprofitable, and only by disclosure—advertising—is it multiplied a hundredfold.

Full particulars concerning Postal Classes for Civil Service, Journalism, Sloan-Duployan Shorthand, Book-keeping, French, &c., free on application to Hatchard and Castaréde, Limited, 71 High Holborn, W.C.

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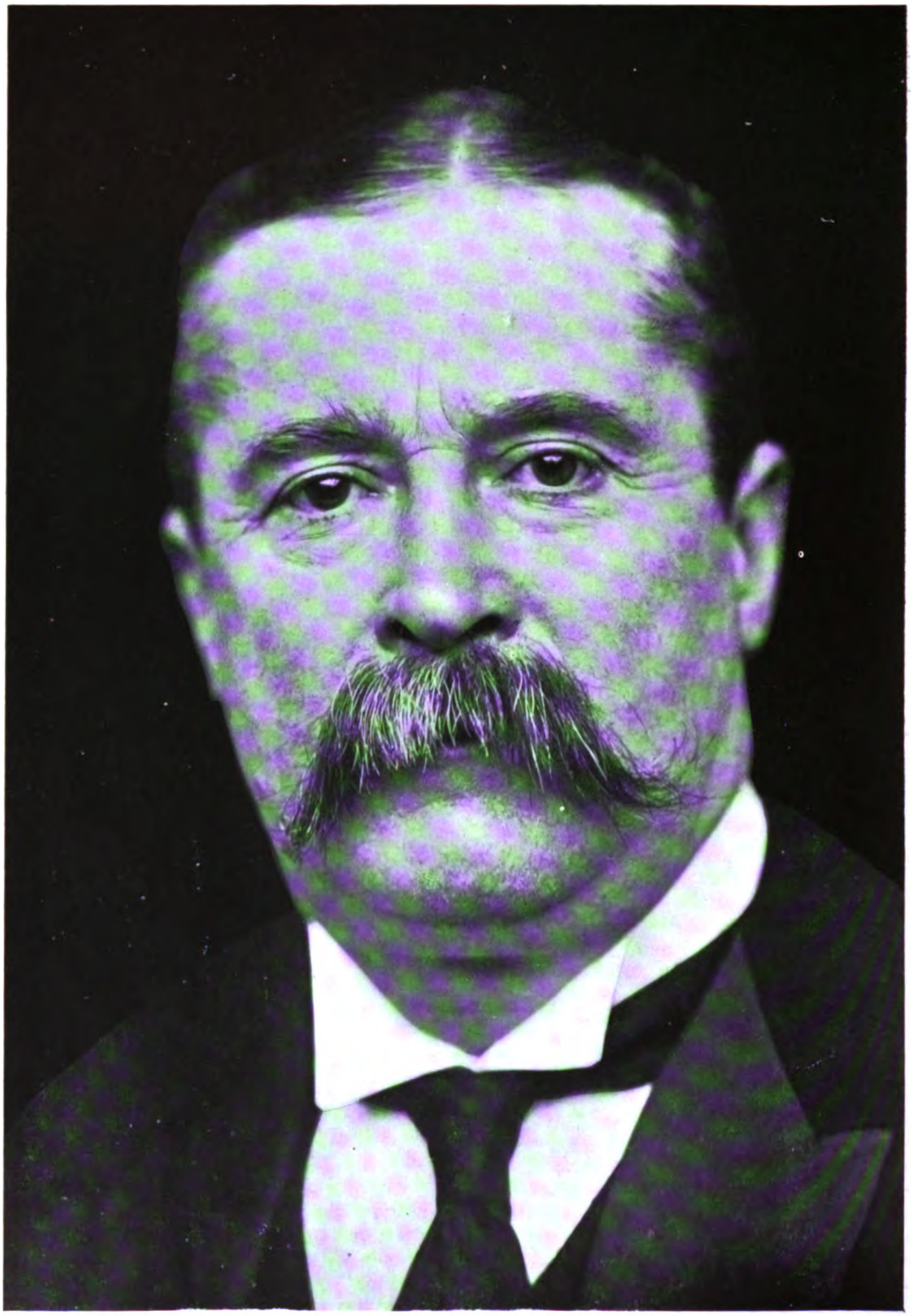

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COLONEL H. C. L. HOLDEN, R.A., M.I.M.E., F.R.S.

SUPERINTENDENT OF THE ROYAL GUN FACTORY, WOOLWICH

CHAIRMAN OF THE AUTOMOBILE CLUB OF GREAT BRITAIN AND IRELAND

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The World's Work
And Play

EDITED BY HENRY NORMAN, M.P.

VOL. V LONDON, FEBRUARY 1905 No. 27

SPRING IN THE MOTOR WORLD

THE AWAKENING OF THE MOTORIST—THE CHOICE OF A CAR FOR 1905—THE RICH MAN HAS AN EASY TASK, WHILE THE MAN OF MODERATE MEANS IS PUZZLED—SMALL CARS AND THEIR ESSENTIALS—A NEW SMALL CAR: THE ADAMS-HEWITT—THE PARIS AND LONDON MOTOR SHOWS

BY

HENRY NORMAN, M.P.

THIS is the time of year when the motorist awakes. The last of the shows will soon be over, he has seen all the new patterns of cars, he has carefully studied advertisement and catalogue, he knows what are to be the features of the year in his pet pastime. The winter will ere long be over and gone, the roads will be in good order after their alternate soaking and freezing, the buds and the birds will be signalling the birth of another season, and the ferment of nature which sends the sap up to the tip of the topmost branch, stirs also his pulses at the call of the long road. Happy the motorist who sold his last year's car at a good price before the winter, for he would have had little joy of it during these past months, and now he has the fascinating pleasure of selecting a new one and affronting a fresh series of experiments and excursions. There was a time when my greatest pleasure—of such pleasures—was to buy a new horse, either for myself or for anybody else—the latter a responsibility which the real horse-lover declines in theory and welcomes in practice. Now my chief pleasure of the same kind is in buying a new car, or helping a friend to buy one. If I were a millionaire I should buy a fresh car every Saturday, for I find an unequalled fascination in them, arising—so far as I can analyse it—from the unique combination of the greatest possible interest in the mechanical problems involved and their ever-growing solution, and of the consciousness that one is concerning oneself with the beginnings of a movement destined to affect profoundly the thought, habits, the opportunities, the happiness of civilised mankind. Therefore, to me the problem of the carburetter, for instance, is much more than merely a question of how to secure a constant perfect proportion between air and petrol-vapour—it is part of the great social problem of the future. Do not scoff, O reader: perhaps there are more things in automobilism than are dreamt of in your philosophy.

As I was saying, now is the time when the motorist (who has not been wise enough to order earlier) bethinks him of his new car. What shall he choose? This question is asked me, and of course of many others, several times every week. I always begin by replying, "It depends upon two things: What you want the car to do, and how much you are prepared

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to pay for it." When the inquirer tells me that he wants it to carry from five to seven people, to be fast, silent, and reliable, and that he does not mind much about price up to a thousand pounds, my interest in him is not so great. There are so many good cars to-day for the man who will give £1000, that except to avoid one or two makes there is little advice to give him. He might throw his hat into a group of cars of a dozen leading makers and be satisfied to select the one it fell upon. If he has any technical knowledge, then he would naturally select one make in preference to another for some mechanical feature peculiar to it which interested him. If price was of some importance to him, he would choose the car in which he gets the most for his money, combined with good workmanship. The rich man need not be anxious; with a very small amount of advice from a knowing friend, and sense enough to avoid "freak" cars, he cannot get a bad one. If he does, he deserves his fate, for it is his own fault. He can afford to make experiments, he can keep an expert driver-mechanic at high wages, he does not mind a big annual tyre bill. In a word, his well-filled pocket takes care of him, and a Mercedes or a Napier or a "C.G.V." or a Daimler, or a Panhard or a De Dietrich or a Bollée will give him his money's worth.

The next class of purchasers has till lately stood in need of counsel and warning, but with the development of motor engineering a varied choice of satisfactory cars is open to them. I mean the class of people who propose to pay from £400 to £500 for a car. They may take a Pipe, an Argyll, a Rolls-Royce, a Clement, a Sunbeam, a Renault, a Talbot, or one of several others, according to taste and judgment. But the third class—the vast class—who want to have something left out of £200 when they buy a car, who wish it to last for a number of years, and who do not feel able to face an expensive tyre bill or pay the wages of a driver-mechanic, and who yet greatly desire to own a car—this class is not so happily situated. A score of cars are offered them, but hitherto not one that I, for example, have ever felt able to recommend unreservedly—as readers of my article upon the late small car trials at Hereford will understand.

As my readers will know, my own chief interest in connection with motoring has always been in the light, inexpensive car, for I am convinced that the use of this will, before long, be universal among all who can possibly afford and house it. When one reflects that there are not five thousand cars in London, a city with five millions of people, one realises the enormous potential demand that exists. The comparatively trifling sales of cheap light cars are due, in my opinion, to two causes: first, people have not yet waked up to the pleasure and profit conferred by the possession of such a vehicle; and, secondly, those who have bought them have not been satisfied. I have long had my own opinion of what such a car ought to be. I have never believed that a satisfactory small car would be produced on the lines of the large car, with all its complications, but without the possibility of spending enough time and money upon it to ensure the successful working of these. The small car ought not to be much less than ten horse-power, otherwise it will not be powerful enough to give a good average speed, say twenty miles, and to take four passengers satisfactorily up all hills. This horse-power cannot be obtained from a motor with a single vertical cylinder, without so much noise and vibration, owing to the high speed, as to render the car thoroughly uncomfortable. But it can be obtained from the comparatively slow-moving, horizontal engine, which also lends itself much better to the construction of a small car. Therefore the ideal small car must have a horizontal engine. It must, further, have two alternate systems of ignition, as so large a proportion of failures on the road are electrical failures. Again, as it is by the hypothesis to be used by a non-expert, not only must the engine be very simple, perfectly accessible, and so standardised that a new part which may break or wear out can be replaced by anybody without skilled fitting, but it must also present no problems of lubrication or supply of mixture to the cylinder. This means that it must have an automatic system of oiling and a really automatic carburetter. It must carry two people at 20 miles an hour, with the possibility of two more or their equivalent in luggage behind. It must sell for a price under £200. A car fulfilling these conditions, in my opinion, is now about to be placed upon the market. At the same time my readers must clearly understand that, as regards this particular car, I am writing of a vehicle in which I have a direct personal and pecuniary interest.

In January of last year I went to America with the object in large part of seeing certain new private developments in the manufacture of motors. There I found that Mr. E. R. Hewitt had for a long time been working upon a car on exactly the lines that I myself had gradually

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THE HON. JOHN WALTER EDWARD DOUGLAS-SCOTT MONTAGU, M.P.

WHO HAS DONE MORE TO PROMOTE THE DEVELOPMENT OF MOTORING AND THE INTERESTS OF MOTORISTS THAN ANY MAN IN THE KINGDOM

A photograph specially taken for THE WORLD'S WORK

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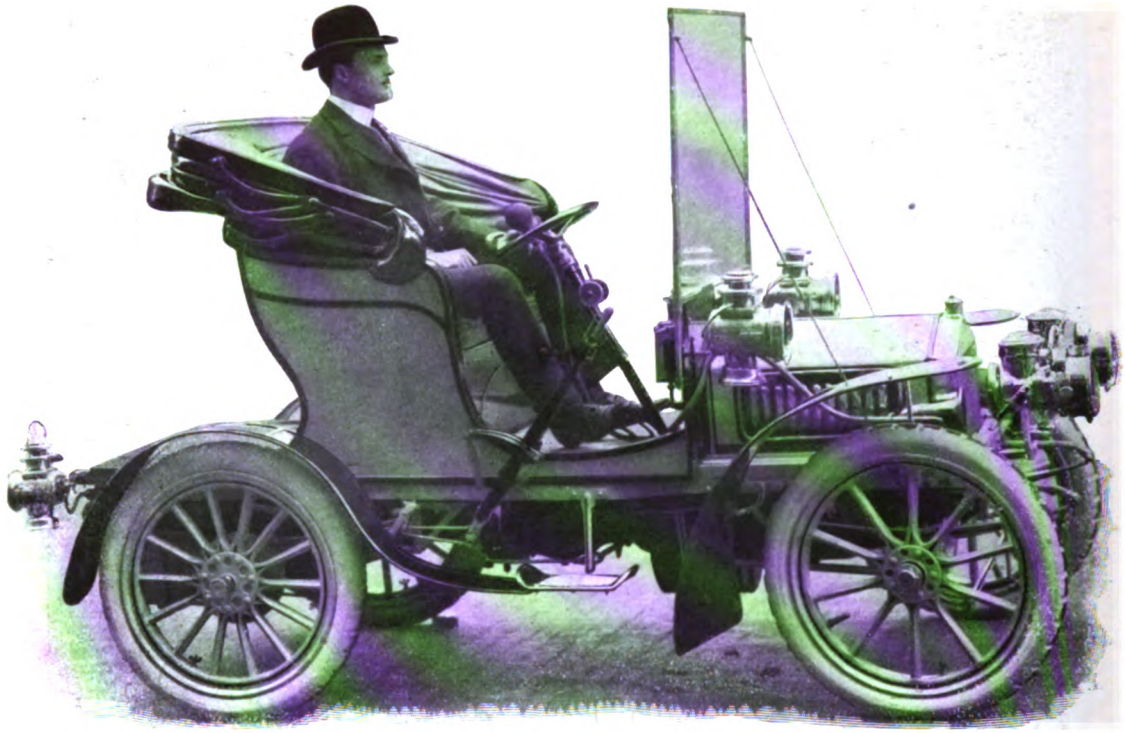

THE NEW 12 HORSE-POWER ROLLS-ROYCE CAR

The Hon C. S. Rolls driving

been led to regard as the right ones. He had made in succession three in his private workshop, and after severe trials on the road, in the shop, and seeing it taken to pieces, I came to the conclusion that this, with certain changes, was precisely what was wanted. I therefore made arrangements for him to bring it to England with a view to its being manufactured here. He did so last July. I met him on the arrival of the steamer, and we drove the car a hundred and eighty miles from Exeter to London in eight and a half hours actual driving time. Since then the car has been in constant use, it has been further improved under the direction of Mr. A. H. Adams, a well-known expert in modern manufacturing methods, a specialist in motor construction and a director of an important engineering business, and in a few weeks from now it will be on sale for anybody who wants it. Further particulars of it will be found in the Industrial Supplement in the advertising pages at the commencement of this magazine. I myself shall be glad to supply any other information desired. It will be on exhibition at Olympia at stand N. 133A, (the only space we have been able to secure) adjoining the stand of Messrs. E. and H. Hora Ltd., in the annexe, and a car will also be there upon which any intending purchaser may ride.

My advice to all who are thinking of owning a small car during the coming year is that they should carefully examine all those that are offered, and thoughtfully weigh the relative advantages and disadvantages so far as their technical information enables them to do so. Above all, they should on no account invest in a light car without having a good ride on it, testing alike its handiness and silence in traffic, its speed upon the road, its hill-climbing powers and its simplicity and accessibility.

* * * * *

The motoring season of 1905 really begins with the Paris Automobile Show of 1904, for it is there that everybody expects to find the new developments and inventions for the following twelvemonth. Our own Show at Olympia comes too late (February 10–18). By holding it in the spring, we concede the first place to the French Show; we send to France thousands of visitors and large sums of money which we might have kept at home; foreign cars are not placed on terms of equality at Paris, any more than at the New York Show, both France and America being less sportsman-

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THE HON. ARTHUR STANLEY, M.P.

VICE-CHAIRMAN OF THE AUTOMOBILE CLUB OF GREAT BRITAIN AND IRELAND

AN INFLUENTIAL PARLIAMENTARY SUPPORTER OF MOTOR INTERESTS

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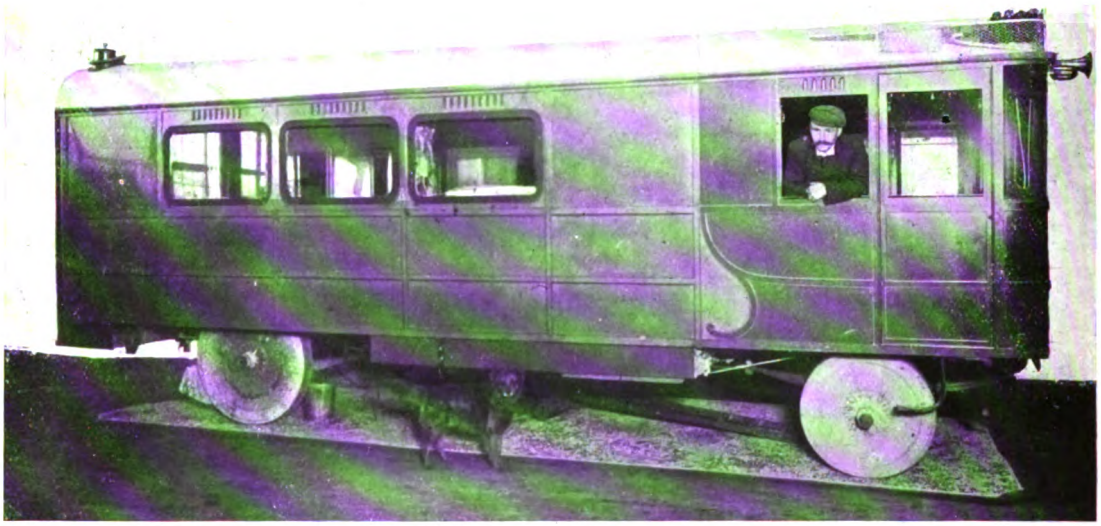
like in this matter than ourselves; and finally, it is of importance to both agents and makers that the new season's cars should be visible to the public as early as possible, so that new cars may be ordered in time for delivery when motoring begins. February is much too late for this, and many disappointments over non-delivery are inevitable. England is so much the best market for automobiles that we can compel foreign makers to accept our time for exhibition, and it is therefore to be hoped that the next British official Show will be held earlier.



A FRENCHMAN'S MOTOR CARAVAN

This curious motor car is 32 ft. long, and is mounted on solid wooden wheels. It contains kitchen, dining-room, sleeping-room, and engine-room. The motor is of 20 h.p. and gives a speed of about 20 miles an hour

I spent several long days at the Paris *salon*. It was, of course, extremely interesting to any motor enthusiast, but disappointing in the absence of any novelty, and above all in its failure to show us any new light car. The electric lighting was superb, the grit underfoot, the dust and the cold abominable, and the catering the very worst I have ever seen at a public place. The five-franc luncheon would have been disgraceful anywhere—but in France! The catalogue was as bad as it could be. There was no cloak-room, and most of the attendants did not know the topography of the place. But when it was lighted up—which was only for a short time, as it closed at seven o'clock—the brilliant colour of the long rows of splendid carriages made a magnificent spectacle.

There was no constructional novelty of importance in any car, and I feel sure that changes of arrangement on many cars had been introduced rather that the makers might advertise a "new model" than because any advantage was thereby secured. Indeed, on more than one car that I know well, I thought the changes were distinctly for the worse. The fifty horse-power Panhard had a new clutch, but I do not suppose my readers take more interest in these monsters than I do myself. They will find it fully described in the technical press. The trend of French practice and the character of the French market are well shown by certain statistics compiled by a Paris paper. Of the motors themselves, 56 per cent. were above twenty horse-power, and 37 per cent. between eight and twenty horse-power. No fewer than 72 per cent. had four cylinders; 94 per cent. were controlled from the inlet, control from the exhaust thus being virtually obsolete; 73 per cent. had mechanically operated inlet valves, the automatic valve clearly becoming obsolete fast; 20 per cent. had metal to metal clutches—the coming form; 51 per cent. had live-axle drive, 70 per cent. pressed steel frames, high and low tension magnetos were in about equal number, while only 16 per cent. had batteries. There is in all directions a welcome tendency to more careful workmanship, neater fitting of such things as ignition wires, water connections,

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COLONEL MARK MAYHEW

VICE-CHAIRMAN OF THE AUTOMOBILE CLUB OF GREAT BRITAIN AND IRELAND; COMMANDING OFFICER OF THE MOTOR VOLUNTEER CORPS; AN INTREPID DRIVER OF RACING CARS

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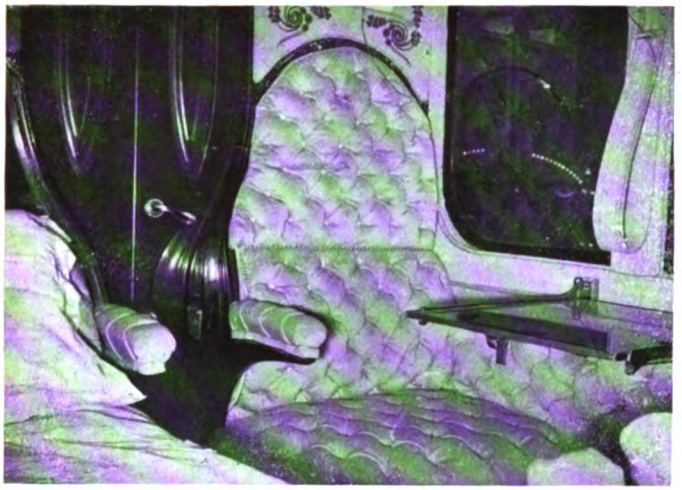
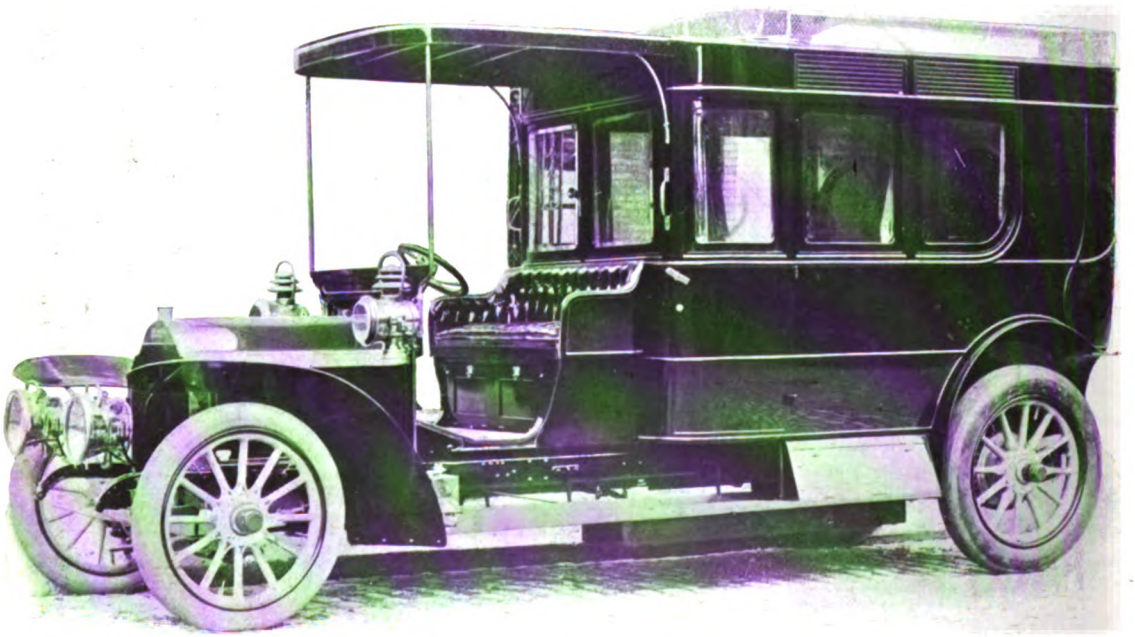


BED AND FAUTEUIL OF THE DE DIETRICH SALOON

and protection of working parts from dust. The tonneau with rear entrance has disappeared from all expensive cars—a development which might have been foreseen by any lady who has had to step into the mud to get into her motor-carriage. An ingenious idea shown by Messrs. Luc, Court et Cie., interested me. It is a *voiture démontable*—a car with a main frame in two parts, of which the front consists of engine, dustboard, gear, front wheels and steering. The propeller shaft can be disconnected behind the gear-case, and the idea is to have the back part of several vehicles, each on its own back wheels and live axle, any of which can be connected in a few minutes with the front driving part. Thus a resident in the country could have an open car, a brougham, a luggage or shooting cart, all with the same motor. There are great possibilities in this.

The most dominant impression, however, was the general increase in power and luxury of the automobiles exhibited. It was a rich man's show. Every maker seemed to be aiming at the patronage of the rich amateur, not of the general public. It was difficult to find a cheap light French car in the whole Show, whereas at every turn there was a magnificent brougham or limousine or landaulet or *voiture de route*, gorgeous in colouring and palatial in upholstery, on a twenty or thirty or forty horse-power chassis. It is certain that in England the most paying car of the future will be the car that just really satisfies the demand for a small, simple, powerful, reliable, cheap car. Why should this not be so in France? Maybe because in France the man who could afford £175 or so for a car would



THE 40-H.P. DE DIETRICH TOURING AND SLEEPING CAR

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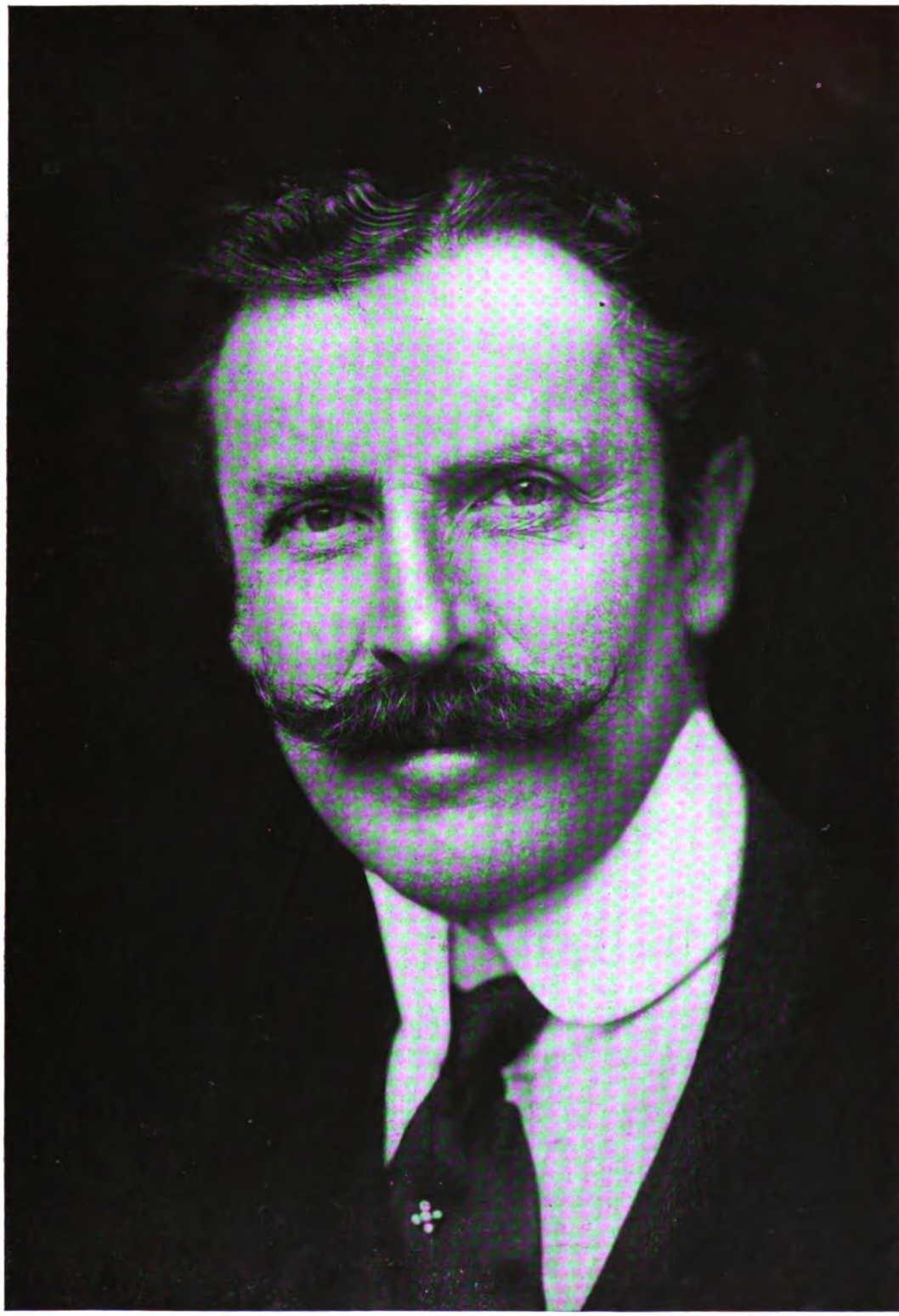

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MR. JULIAN WALTER ORDE

SECRETARY OF THE AUTOMOBILE CLUB OF GREAT BRITAIN AND IRELAND, WHOSE ORGANISING ABILITY AND TACT ARE GRATEFULLY RECOGNISED BY ALL MOTORISTS

A photograph specially taken for THE WORLD'S WORK

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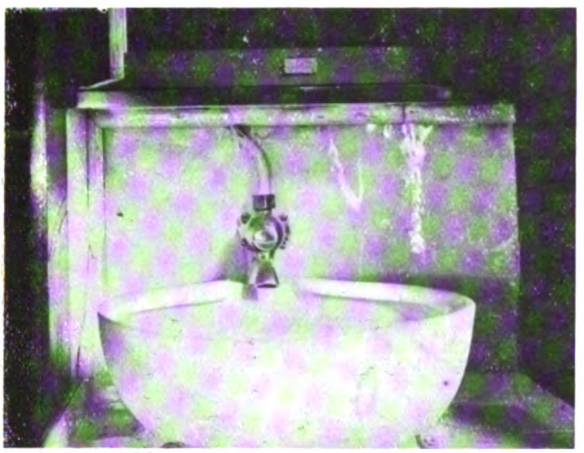
consider this an unjustifiable luxury for his position, and would save his money. Whatever the explanation may be, however, the fact is plain: it is not to France that we must look for what will be the most valuable car in England, and the most widely used.

Of individual cars at Paris, those that interested me most were the new eighteen and twenty-five horse-power "C.G.V.," the twelve horse-power Rolls-Royce, the twelve horse-power Pipe—a really excellent car in its new form—and the Argyll. The latter did great credit to British workmanship, being constructed with both knowledge and conscience. The twelve horse-power Rolls-Royce is an



THE LAVATORY OF THE DE DIETRICH SALOON CAR

admirably built car, and a very pleasant one to drive through traffic, being both silent and elastic. There is no fault to find with it except its price, which is high for its horse-power. But this appears to be the tendency, for the twelve horse-power Pipe costs about the same, and, after all, silence and reliability are well worth a little extra money from those who can afford it. I drove a "C.G.V." last summer a good deal, and liked it very much. It had but one fault—a bad one, namely, that there was no direct drive on the top speed, the gear-wheels being therefore always in mesh. I would not buy any car in which this is the case. But in the 1905 type this fault is removed, and several improvements added. Therefore, being asked to choose a powerful touring car for an American friend's next summer in Europe, without much regard to price, after a good look round I selected the twenty-five horse-power "C.G.V." as certain to be satisfactory. I spent an hour or two at the works of Messrs. Charron, Girardot and Voigt, to make sure. Their workshop methods are old-fashioned, but the work is extremely conscientious. The Argyll had two features of special interest—the metal disc clutch of Prof. Hele Shaw, in which I believed when I first saw it nearly two years ago, and bodies of graceful shape and great strength stamped out of lead-coated steel by Messrs. Sankey and Sons of Bilston. This, in my opinion, will be the body of the future, for cars of moderate price, displacing both wood and aluminium. On the "C.G.V." stand, by the way, was the best arrangement I have ever seen for showing the non-expert the working of a petrol motor, consisting of a four-cylinder engine, driven by a small electric motor, with metal cut away to show the movements and functions of every part. I was glad to learn that this is coming to Olympia. Half an hour spent in watching it will teach more than hundreds of pages of diagrams and descriptions.

To me the most interesting part of the Show was the vast collection of "accessories" of all kinds, and I spent many hours in the galleries containing these, picking up many a suggestive idea, and reaching home with my pockets bulging with sparking-plugs, wire terminals, pole-finders, a new accumulator, a new pocket electric lamp (the "Halo," of which the cells are really "dry" and do not produce current until water is added, thus enabling refills to be kept indefinitely), the most compressible stool I ever saw, for use in a tonneau, and actually a pocket lifting-jack! But it would take far too long to tell of all these. One remarkable vehicle, however, must not go unmentioned—the imposing *voiture de route* shown by the De Dietrich Company, and illustrated here.

This remarkable carriage—known as a "limousine de grand tourisme"—is intended to convey at least two people about the country for considerable periods independently of any hotel accommodation. Its engine is of forty horse-power, the length of the car thirteen and a half feet, and its weight rather over two tons. It consists of a saloon 6 ft. 6 in. by 3 ft. 3 in., containing four arm-chairs, two of them being pivoted. When the latter are turned to face the former and mattresses put between them, two comfortable beds are formed. The saloon contains folding-tables, cabinets, writing-desk, medicine chest, &c. The back part is shut off by folding mahogany doors. I have never

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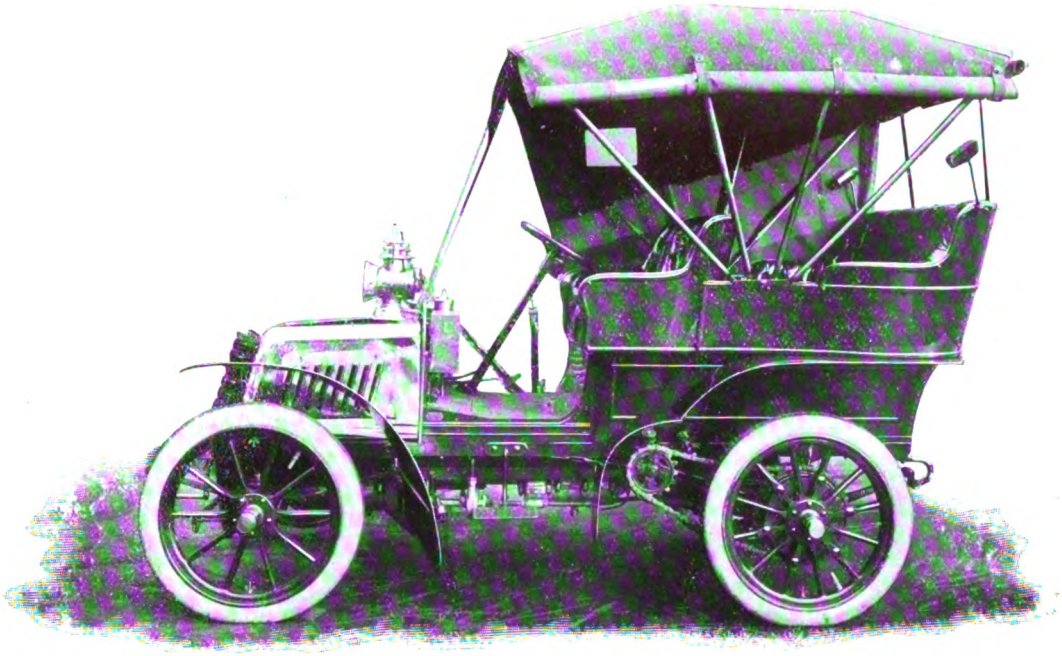
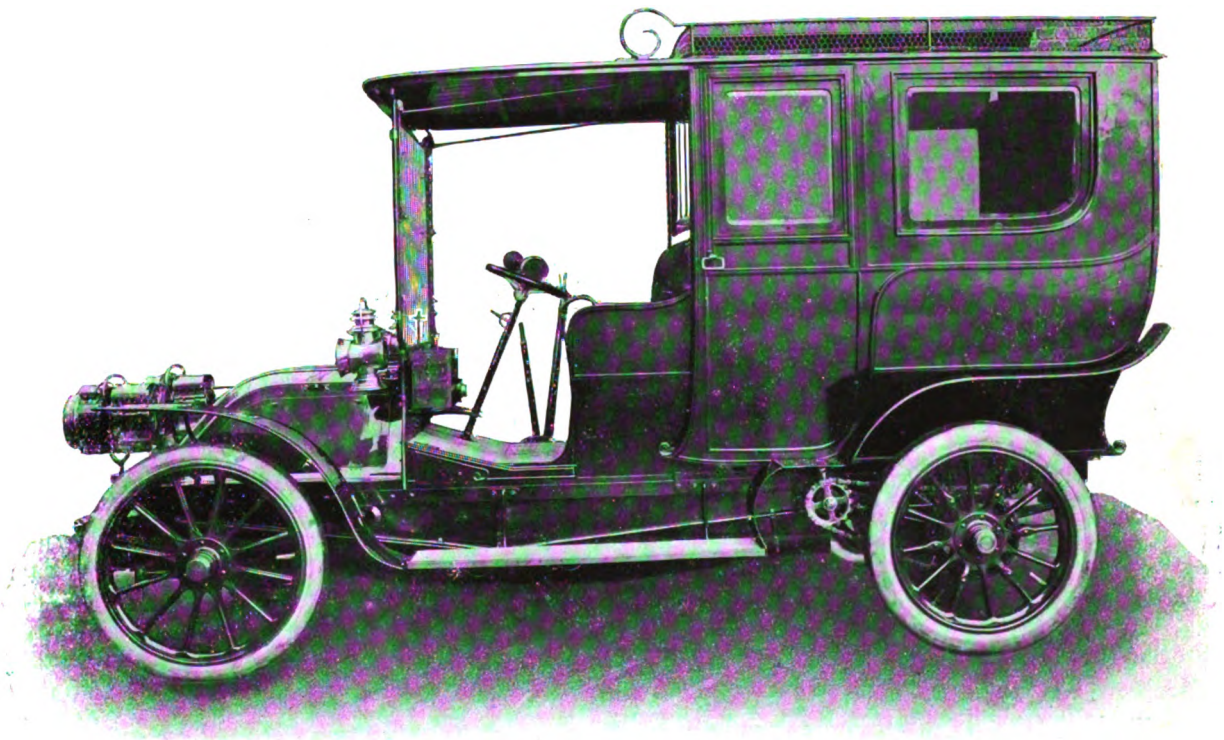


THE NEW 12-H.P. PIPE CAR



A NEW 18-H.P. "C.G.V.," WITH BROUGHAM BODY

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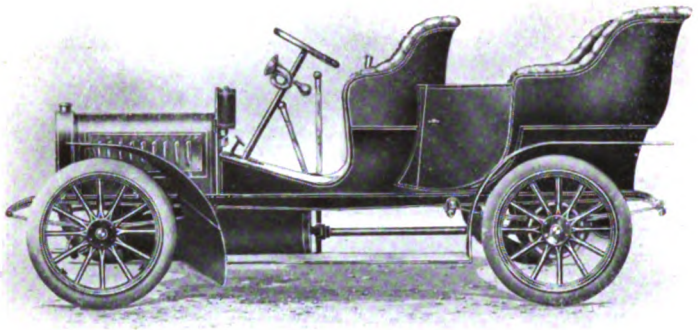

THE "ARGYLL" 10–12 H.P. SIDE ENTRANCE CAR

seen so striking an example of *multum in parvo*. On the right side there is a washstand, with fittings for hot and cold water, a dressing-table with three mirrors, a complete lavatory on scientific principles, a linen cupboard, a cupboard for toilet articles, and a chest for boots. On the left side there is an ice-box, a cupboard for photographic accessories, a hanging cupboard, a kitchen with spirit-stove, two drawers for table-linen, and a chest for food and table-service. The rear door has two windows, one of which is of red glass, to enable the little apartment to be used as a photographer's dark-room. The car has been sold, I am told, for £2000. Few experiences could be more delightful than to travel in such luxury and with such absolute independence through an interesting country in beautiful weather, and I should think it probable that other makers will follow this example at the behest of their wealthy clients. For a summer in Hungary, for instance, one of the most interesting of lands, inhabited by one of the most charming of peoples, but where it is necessary to leave the trodden route and where hotels are either non-existent or bad, such a moving home would find an ideal use.

On the whole, I feel sure that the Exhibition at Olympia will be more interesting and instructive, so far as cars themselves go, than the Paris *salon*, and everybody who wishes to keep abreast of the development of motoring must on no account fail to see it.

Photo by Davey. From *Motoring Illustrated*

ADAPTING THE HORSE-DRAWN 'BUS FOR MOTOR TRACTION

In this motor omnibus, which has been running in London streets since December 19, the chassis was designed by Messrs. Moss and Woodd to take the existing horse-drawn omnibus

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MOTOR CYCLISTS IN CAMP AT CHESHAM

MOTOR-CYCLE CAMPING: THE NEW INEXPENSIVE HOLIDAY

HEALTH AND EXERCISE—WHAT TO WEAR AND HOW TO PREPARE—THE ADVANTAGES OF A PORTABLE HOME—PERSONAL EXPERIENCES—A WEEK'S TOUR FOR TWELVE SHILLINGS AND SIXPENCE

BY

F. HORSFIELD

HON. SECRETARY OF THE ASSOCIATION OF CYCLE CAMPERS

THE possibilities of carrying on an ordinary cycle all the articles necessary for camping have been amply demonstrated by more than a hundred members of the Association of Cycle Campers. But the greater advantages of the motor-cycle for this sport are obvious: (1) The camper is enabled to go further than when dependent upon his own unaided efforts. (2) He can cover the ground more rapidly. (3) He is not compelled to study so much the weight of his kit. So far as I know, only eight of our members use the motor-cycle in connection with camping, but with the advent of lighter and cheaper machines the number is certain to increase largely.

At the last united camp of the Association, which was held during the Christmas holidays at Cherry Tree Farm, Ley Hill, Chesham, four tents were erected, the enthusiasts (four of whom were ladies) preferring the health and exercise of camp life to the orthodox indoor gatherings. Two large braziers were kept going the whole time—more on account of their cheerful appearance than for warmth, as it is well known that one feels the cold but little when always in the open air. The accompanying photographs show the tents erected, and a motor-cycle with "all on." From the latter it will be seen that, if care be exercised in the packing, the kit can be kept within strictly moderate dimensions. Few would imagine that all that is necessary for sleeping accommodation and cooking is stowed away in the Japanese basket and pannier bags—which have been found the

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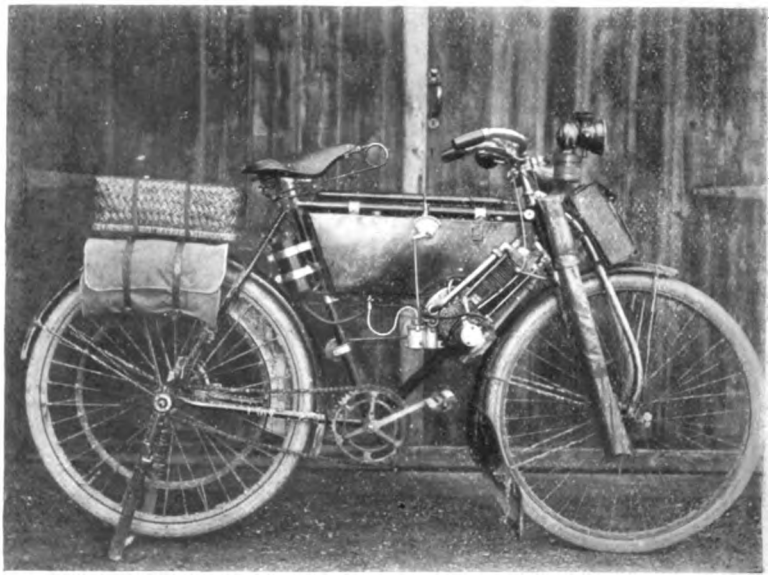
lightest and cheapest receptacles for the separate articles which together make a complete camping kit. The baskets, being telescopic, adapt themselves to the load, which varies according to the quantity of provisions on hand.

The motor-cycle in the photograph in which the tents are shown has a side carriage, but this has been discarded by the owner in favour of a tricar, as he found the side strain too great, spokes continually giving way. I understand this drawback has been overcome, and we may expect to see these attachments more largely used in the future, as they certainly appeal to many on account of their sociable appearance.



A MOTOR-CYCLE WITH "ALL ON"

The whole camping kit weighs 22 lbs. 3 ozs., and costs £8 13s. 9½d.

Now as to the kit; I give below the separate items required, with their respective weights and cost:

	Weight.		Price.		
	lbs.	oz.	£	s.	d.
Tent, "A" or "Gipsy" pattern	2	8	1	5	6
Poles	2	8		13	6
Pegs, 2 dozen (aluminium)		12		3	0
Fly-sheet	2	4		14	6
Sleeping-bag (about)	2	0	1	8	6
Ground blanket	1	2		13	6
Ground sheet	1	8		13	6
Down pillow		4		3	6
Eiderdown quilt	3	0		12	6
Stove (filled)	3	2		12	6
2 saucepans, 1 fry-pan (aluminium)		12		6	9
Spirit-can		3			10
Candelabra		2		2	6
Milk-bottle, without cover (aluminium)		5		3	6
2 boxes for tea and coffee holding ¼ lb. (aluminium)		2			9
Jam-pot, double lid (aluminium)		2		3	6
Condiment case, 3 sections (aluminium)		1		1	3
Butter-pot (enamelled iron)		3		1	0
3 large spoons (aluminium)		1½			9
3 forks (aluminium)		1½			9
3 teaspoons		1			4½
3 knives (aluminium handles)		4		3	9
Teacup (enamelled iron)		2			4
Rubber bags for sugar, oatmeal, bread, &c.		3		3	0
Water-bucket for washing		4		1	0
Canvas water-bucket, holding 1 gallon		4		3	3
Total	22	3	8	13	9½

In view of the heavy dews of summer, thin goloshes, fitting over the stockings, are strongly recommended; these should be packed in a convenient place, as it is advisable to remove one's boots soon after leaving the high road. I have made no reference in my list to toilet requisites; these vary so much that they can only be left to the individual camper.

Candles are found more satisfactory for lighting the interior of the tent, as the light is diffused over the whole area, whereas if a cycle-lamp be used the light is concentrated, leaving part of the tent in darkness. The candelabra—a grand name for a small tin receptacle for two candles!—is suspended from the roof by a thin aluminium chain. The prices quoted for each article comprising the camp kit are those charged by the designer. I would point out, however, that a considerable sum can be saved by the prospective camper if the tent, poles, ground blanket, and sleeping-bag be made at home, and to assist him in doing this he will find full measurements of the tents in the Handbook of the Association, which is supplied to non-members at a charge of 6*d*.

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The material found, after exhaustive tests, to be the most suitable for cycle-tents is a special kind of lawn of very fine texture. It is not waterproof, but the tension is so great that the rain runs off as from an umbrella. For motor-tents "*beaten* linen" is sometimes used; this material is more durable and costly, while at the same time it is heavier and more bulky.

The poles, which are of cane, must be very carefully made, as much depends upon their strength; the ferrules should be of brass, and these can be procured from any fishing-rod manufacturer. As the poles strap to the forks of the machine, they are made in sections, varying according to the type of tent chosen. The tent known as the "A" pattern is the simplest to make, as it is merely two widths of material joined together; a width and a half, gored, form the back and front. The "Gipsy" pattern is much more complicated, having an entirely separate roof, which also necessitates two extra poles as stretchers.

To make the pegs, get one pound of quarter-inch aluminium wire; form the eyes by twisting round a poker or similar instrument, and the points by hammering them out and finishing with a file. The cost will work out at 1*s.* 6*d.* a dozen, as against 4*s.* for iron ones, and the saving of weight is considerable, for if a fly-sheet is used twenty-five pegs will be required.

The sleeping-bag may be made of any all-wool material, four and a half yards being required. In choosing the stuff, weight and bulk should be considered. When camping in cold weather it is advisable to add a small, cheap, eiderdown quilt to one's kit. It is astonishing how little space it occupies when rolled up in its thin mackintosh case.

In the photograph which shows the tents erected it will be seen that all but one have the additional comfort of a fly-sheet. The advantages of this are manifold: (1) The tent itself is kept perfectly dry in wet weather. (2) Articles may be placed close to the tent walls (those who have camped in the army bell-tents will appreciate this). (3) The tent is delightfully cool in summer, and warmer in winter than if a fly-sheet is not used.

My first introduction to motor-cycle camping took place under the following circumstances, and may be interesting to those of my readers who intend taking it up. Having seen some notes in the *C. T. C. Gazette*, by Mr. Holding, the President of the Cycle Campers' Association, I wrote to him and discovered that he was lecturing at Fulham. He cordially invited my wife and myself to attend, and we were much entertained by the rapid and easy manner in which the tent was erected on the stage. This was in February 1902. Measurements and plan for making the tent were supplied to us, and, its manufacture effected, we were anxious to test it, as we felt that the material was so light in texture that it could not possibly withstand an all-night rain.

Our opportunity came when, having joined the Association, we received notice of the Whitsun Camp, which was held at Haversham, near Stony Stratford.

We intended riding down, but as we were starting the rain came down in torrents. In the hope that it might clear, we took train to Wolverton, and rode from there to the spot chosen for the camp. In our ignorance we felt certain that, for that night at least, camping would be abandoned, and we were fully prepared to spend the night at an hotel. On mentioning this to Mr. Holding, he at once ridiculed the idea. He brought us some straw, which was placed on the damp ground; on the top of this was spread the rubber sheet and thin blanket, and in a few minutes we had the tent up and tea well on the way.

Since then we have camped hundreds of times in all kinds of weather—including a snowstorm—in Brittany, Belgium (when we made the tour of the Ardennes), and various parts of England. We never felt the benefit of our portable home so much as when we arrived at Ostend late one very wet night and found all the hotels crammed. It was too late to think of riding on, and, on the advice of a resident, we pitched our tent in the public park.

There is a natural feeling of diffidence in asking permission to camp for the first time, but this is soon dispelled by the cordial manner in which it is invariably given. For foreign touring it is essential to have a fair knowledge of the language of the country, as the requirements are certainly unusual, and much speculation is indulged in by the natives as to one's object in spending a holiday in this way. After obtaining permission to camp, which it is advisable to do before dusk, choose if possible a site protected by a thick hedge, as the wind is the only element to be feared, the resistance offered by the tents being great. A slight slope from head to foot adds vastly to one's comfort. In early spring and late autumn I would recommend that straw be procured, as the ground strikes very cold at those seasons. This may, however, be dispensed with during the summer months, as there is not the slightest

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fear of the dampness penetrating the ground sheet, which, though thin, is of the purest rubber.

When the tent is pitched and the baskets ranged round the inside for the reception of the odds and ends, one's first consideration is for the motor-cycle. Stabling can usually be found in one of the outhouses of the farm, but, failing this, a mackintosh cover—on the lines of the "oyster" covering which is sold for the greater protection of cycles when taken by train—has been designed which protects all parts, and the machine is safe even though it rain all night.

One is now free to prepare an appetising meal, and having previously laid in a stock of provisions and a supply of water, the stove is lighted. It is astonishing what a variety of dishes can be prepared in camp! Breakfast usually consists of porridge, eggs and bacon, and coffee, while for dinner one has the choice of veal cutlets, steak and tomatoes, liver and bacon, fish, stewed rabbit or chicken, omelettes or pancakes, and in fact anything not requiring an oven.

The Jupiter stove mentioned in the list of requisites is extremely powerful, and will boil two quarts of water in eight minutes; the fuel used is kerosene, and the cost is trifling, as the stove burns five hours for 1*d*. It is wickless and burns under air pressure with a clear blue flame. It is started with a spoonful of methylated spirit, which serves to heat three upright tubes, thus generating a gas; the heat is regulated by a valve, and pumping is necessary once an hour only. To shield the stove a piece of the tent material is shaped and pockets run in to take four thin cane sticks, which are forced into the ground and keep the wind from the flame.

It is pleasanter to cook outside one's tent. Where there is frying to be done, the grease is apt to sputter, and the consequences are disagreeable if this happens in the tent. Washing up after meals is, to the uninitiated, the bugbear of camping, but, with a plentiful supply of soap and hot water, the greasy pans and plates are soon made bright and clean.

An enjoyable smoke and a chat over the events of the day, and one thinks of "turning in." The articles not required in the tent are placed under the fly-sheet. One's clothes, removed and folded, make a good foundation for the tiny eiderdown pillow. The sleeping-bag is entered, the eiderdown quilt is fastened to the pegs of the ground sheet at the foot of the tent, and the camper is soon sleeping soundly.

Apart from its independence, the economy of a holiday spent in this manner will appeal to many, as one lives at the bare cost of the food consumed. The camper is rarely expected to pay ground rent, the farmer considering himself recouped by the purchase from him of the eggs, butter, milk and cream required. The enjoyment of a holiday is frequently in inverse ratio to the outlay. The expense for a week's touring per person need not exceed 12*s*. 6*d*., this even allowing for the large appetite which is acquired through living entirely in the open air.

Another agreeable feature is the opportunity afforded for greater insight into the life of the people of the country through which one is travelling. We have many pleasant recollections of our numerous hosts and their kindness to us. When touring through the Ardennes we overtook a party of English cyclists, and they were much interested in our doings. We had spent the night in a charming wood near Dinan, while they had put up at the chief hotel in the town. They told us they had had no sleep during the whole of the night, as they were kept awake by the chimes, and also by the frequent arrival and departure of motor-cars—the Circuit des Ardennes being in progress.

A question which is frequently put to us is, "How do you occupy your time in camp?" Well, pocket chess and draughts find a place in our kits, but rather as a provision for wet days than for evening amusement, as after the evening meal there is little time and less inclination for anything except to smoke and chat.

Needless to say, great care is necessary in choosing one's companion for a camping tour. An understanding as to each camper's duties should be come to preparatory to starting the tour, as things will thereby run much more smoothly. The official camps, which are held at Easter, Whitsun, and August Bank Holidays, have occasioned many enjoyable tours by members.

In conclusion, I may say that one is not dependent upon fine weather for the enjoyment of a camping holiday. In this respect, indeed, the cycle-camper has a great advantage over the ordinary tourist, for if a heavy storm comes on he can pitch his tent and take shelter in it, instead of having to ride some miles to the nearest hotel.

I think this article will show that cycle-camping is no longer in its infancy, and I hope it will help to solve the problem of many who are seeking an original holiday.

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The World's Work

OUT of the darkness of blind superstition,
Out of the chaos of myth and disorder,
Fearfully, timidly over the border,
Into a land of an ample fruition,
Man is advancing.

Dim, as when mists on some midsummer morning
Veil the first gleams of the sun in his glory,
Dim, through the vapours of dogma and story,
Truth is arising, the daylight is dawning
Over our darkness.

Through the black darkness of dogmas misleading,
Thousands have toiled with a faith single hearted,
Brave hearts have bled—not in vain—and departed,
Leaving to others the fruits of their seeding—
Martyrs to duty.

Is it a dream, a fantastical notion—
This that our search after Truth is a duty,
This that our children may bask in her beauty,
Worshipping Truth with undoubting devotion—
Truth the Eternal?

Else is the Work of the World unavailing;
Naught but a war against want and privation,
Naught but a struggle of nation 'gainst nation,
Man against man—where the strongest prevailing
Lives but to perish.

Out of the chaos of myth and disorder,
Into the glories of Truth the Eternal,
To the possession of pleasures supernal,
Led by the toil of the world o'er the border—
Man is advancing.

W. Bovill.

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THE MARCH OF EVENTS

MR. CHAMBERLAIN IN LANCASHIRE—THE UNIONIST SPLIT—PROSPECTS OF THE SESSION—WILL THE GOVERNMENT DISSOLVE?—THE FALL OF PORT ARTHUR—THE HOPE OF ALL FRIENDS OF RUSSIA

BY

HENRY NORMAN, M.P.

THE air is full of rumours of dissolution, but nobody knows upon what basis they rest. The by-elections continue to prove that the Government has beyond question lost the confidence of every class in the country. Stalybridge has not returned a Liberal member for twenty years, yet so strongly do the people of this important Lancashire constituency disapprove of Mr. Chamberlain's proposals that a Liberal member was elected by a majority of no less than 951. At Mile End the same excuse was used to win that the Government employed to get its majority in 1900, namely, that only one issue was before the electors; in this case the question of the exclusion of aliens. The late Conservative member had a majority of 1160, but this time a Conservative only scraped in by 78. The real point in this alien question was most carefully kept in the background, namely, will the Government introduce a Bill to exclude an alien of good character, on the ground of poverty alone? Everybody wishes the "undesirable" to be kept out; the crux of the whole matter is whether the man against whom nothing but poverty can be alleged is to be excluded. For my own part I do not think for a minute that they will. And if they do not, the electors of Mile End will have been deceived. In any case this striking drop shows that London seats, hitherto strongholds of Toryism, are no safer than seats in any other part of the country. It was embarrassing for Mr. Chamberlain that immediately after the Liberal success at Stalybridge he should have an engagement to speak at Preston, another Lancashire cotton centre. As is now his invariable course, he confined himself to generalities and personalities, refraining from any further disastrous excursions into hard figures. A characteristic example of his looseness of speech was afforded by his remark that "to say that I am bent on making the rich richer, and the poor poorer is an infamous statement," whereas at Birmingham in 1885, he himself spoke as follows: "Protection very likely might, it probably would, have this result—it would increase the incomes of the owners of the great estates, and it would swell the profits of the capitalists who were fortunate enough to engage in the best protected industries. But it would lessen the total production of the country, it would diminish the rate of wages, and it would raise the prices of every necessary of life." If the statement be an "infamous" one, at any rate in his Free Trade days he made it himself. Mr. Macara, President of the Employers' Federation of Cotton Spinners, pointed out next day that when Mr. Chamberlain spoke of the decline in the number of those employed in the trade, he did not apparently know that in the last fifteen years or so, the output of cotton machinery had been increased by at least one-third. "Under Free Trade alone," declared this greatest authority on the subject, "will the cotton trade continue to flourish."

Mr. Hatch, Conservative member of Parliament for a Lancashire seat, remarked that Mr. Chamberlain's pilgrimage was identical in all respects with the Fair Trade agitation of twenty-five years ago. And in further disproof of the statement that the number of those employed in the cotton trade has diminished, it was immediately pointed out that on the contrary it has risen by twenty thousand adults, and that any reduction has been in child labour alone. Mr. Chamberlain has no case—that is the long and the short of it. The country has discovered this fact, and only waits an opportunity to exhibit the political consequences of its discovery.

The Prime Minister still preserves absolute silence upon the fiscal question. He has made one long speech during the month, in which his only allusion to the subject was the statement that he had made himself quite clear upon

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it at Edinburgh, and had nothing to add—his statement, as everybody knows, being so "clear" that two directly contradictory interpretations of it are held with equal confidence.

Sugar continues to rise in price, the number of unemployed through the closing of confectionery works rises lamentably, and the Chancellor of the Exchequer has told a deputation that he will not consider removing a tax upon it which a Conservative Chancellor of the Exchequer himself long ago declared should be taken off at the earliest opportunity. The Unionist Party continues to split on the fiscal question. Lord Belper, Sir Charles Seely, and Mr. C. H. Seely, M.P., have resigned from the Nottingham Liberal Unionist Association; Lord Kelvin has seceded from the Unionist party at Paisley; there is a split among the Unionists of King's Lynn; and at Shrewsbury, Mr. H. D. Greene, K.C., M.P., a lawyer of much distinction, has declared his intention of not contesting the seat again, on account of his dissatisfaction with the position of a private Conservative member in Parliament, and advocates "the establishment or rather the revival of a powerful Progressive conservative association, resolutely determined to resist the introduction of protection." Finally, with so much that Parliament ought to do, Mr. Balfour has fixed its opening for February 14, a fortnight later than anybody expected, or than there is any reason for. What the Government's programme will be nobody knows, probably an Aliens' Bill, and a Bill to incorporate some of the findings of the Committee that has been sitting on the inadequate Workmen's Compensation Act. Nothing has been said of late in inspired quarters of a Redistribution Bill, and the Budget will, of course, be a very difficult one. Moreover, Chinese labour in the Transvaal is resulting—as those of us who know the Chinese always believed it would—in disorder strongly repressed and occasional murder. Thousands of Chinese continue to arrive. It is clear from the fact that three "overseers" were killed in their bunks that the Chinese are beginning to do more or less skilled labour of a kind specifically forbidden to them under the Ordinance; it has leaked out that of the thousand or so extra white men who have found employment since the Chinese importation, a large number are employed upon building the compounds to house these; and none of their wives have come or are coming—a state of things which Mr. Lyttelton declared would be "most wrong." In Parliament, too, the Government will have to face a very severe criticism upon their amazing failure to provide quick-firing field artillery. Since the War our artillery has not been in a condition to meet that of any other great nation, and it will be two years before it is ready to do this.

Ministers must surely be contemplating Parliament with grave misgivings, whereas Liberals and Free Traders, encouraged by their almost unbroken success, are looking forward to it as hounds to a hunting morning. Whether short or not, the session will be sharp and exciting, and it is not surprising that many politicians believe the Government will take an early opportunity of escaping from the consequences of their acts.

* * * * *

The fall of Port Arthur has not so far exercised any perceptible effect upon the course of the war. A large garrison surrendered with it, but curiously the exact proportions of sick and well among the prisoners have not been published. The munitions of the garrison were not nearly exhausted, but there was no meat except horse-flesh, scurvy was widespread, many of the hospitals had been destroyed by shell-fire—not intentionally, of course—medical stores were exhausted and the number of sick and wounded was very large, and it must always be remembered that the same men had been engaged in defending the fortress for seven months, whereas the besiegers had been constantly reinforced. There seems good ground, therefore, for the original and universal opinion that the defence of Port Arthur was one of the most gallant in history, and that General Stoessel is worthy of all honour, and did well to avoid a further perfectly useless waste of life. At any rate the Japanese, who ought to know best, take this view. Assuredly never in history has such a fortress been attacked with such desperate courage and such awful sacrifice of life. The triumph of Japan is naturally very great, and no triumph was ever better earned. Three of the greatest Powers in the world combined to turn her out of Port Arthur when she had captured it from the Chinese, and one of them was allowed—never let it be forgotten, by the colossal blunder of the late Lord Salisbury in withdrawing the British warships at the behest of Russia—to secure it. Japan waited and prepared. Now she has it again, and has broken the record of all sieges and upset all the text-books of warfare in taking it. Her triumph is without parallel. And she will not give up Port Arthur a second time except to force.

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Those who foresaw in the fall of the great fortress and the final destruction of the Russian fleet in the Far East, an opportunity for mediation and a prospect of peace, are shown to have been wrong. It has apparently made no difference. After many contradictory reports the Russian Baltic Fleet is still on its way, somewhere off the coast of Madagascar, where it has been joined by the second fleet which went through the Suez Canal, and a third squadron, but of no great fighting power, is leaving European waters. It is rumoured in London that a hundred colliers are at sea with coal for the Russian ships, and for the past few days the Japanese have been capturing them at the rate of one a day. On the Sha-ho a terrific battle is said to be impending—one of the greatest, as it will surely be one of the bloodiest, in history, for half a million of men will be engaged.

It is thus clear that Russia has no intention of making peace yet. If Kuropatkin is victorious, the whole situation will be changed. Then Russia will be able to secure vastly better terms, or, on the other hand, her prospects of ultimate success will be enormously increased. If Kuropatkin should be routed, Russia will be driven from the whole of Manchuria, and the actual war will be over for a long time, whether peace is signed or not. The case of Rozhdestvensky is different. A victory by him would be almost equivalent to a final Russian triumph, but his destruction would not affect the land campaign. Words fail to express one's horror of the slaughter, past and to come, in this war, but nobody can be surprised, or can blame her, if Russia fights on to the last. It was not to be expected that she would act otherwise, and assuredly we, in her place, should do the same. What was not expected, and what has gone far to upset many calculations—my own, amongst others—was first, the utter want of the Russian preparation for war, both by land and sea; and second, the failure of the Russian fleet even to try in earnest to do what it was built for.

The internal condition of Russia is too difficult and complicated for outsiders to understand. Making every allowance for exaggeration, however, and there is any amount of this, it is more disturbed and uncertain than ever before in its modern history. The letter of Prince Trubetskoi, President of the Moscow zemstvo, to the Minister of the Interior, considering the significance of all its aspects, is one of the most momentous utterances in the history of Russia:

A few days ago I had the happiness to appear before the Emperor, and, as openly as I could, to make a report to him on the present condition of society. I endeavoured to make clear to the Emperor that what was now taking place was not a simple disturbance but a revolution, and further to explain to him what was driving the Russian people into a revolution, which it did not desire and which his Imperial Majesty is in a position to avert. There is, however, only one way of doing so, and that is by the Emperor's placing confidence in the nation and in the forces which the existing estates of the realm constitute. I am strongly convinced in my own mind that if the Emperor, having confidence in them, would only allow these forces to approach him, Russia would be relieved of all the terrors of a sanguinary revolution with which she is now threatened, and would support her Emperor, his autocracy, and his will.

This is the language of truth and patriotism. Its appeal could be granted without departing from the principle laid down by the Tsar in his recent ukase, "the undeviating maintenance of the immutability of the fundamental laws of the Empire." Nobody who knows Russia can seriously consider the introduction of representative institutions of a Western model. To give any kind of direct franchise to a population three-quarters of whom cannot read or write, and who are the easy victims of any new superstition, however foolish or however repulsive, is obviously out of the question. But in the zemstvos and the institutions below them, and the Senate and Council of Ministers, Russia has already the framework for constitutional development under autocracy. Every friend of Russia would deeply rejoice if the Tsar should follow out the impulses of his own generous nature, and confer upon his people this inestimable boon. To do so would, beyond all possible doubt, confer upon himself imperishable glory, it would establish the throne of Russia upon foundations more solid than it has ever known, it would cause Russia to rise in power and wealth through the energies and enthusiasm of her vastly gifted people and through the development of her enormous national resources, and it would give scope to the able and honest statesmen she possesses, while for ever removing from her path that fatal obstacle to her progress, the corruption and irresponsibility of her present bureaucracy. The stronger his friendship for Russia, and the greater his desire for good relations between her and his own country, the more profound must be the hope of an Englishman that this may be. In comparison with this, nothing else is of importance.

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THE TRUTH ABOUT THE GERMAN WORKING CLASSES

WHY THEY ARE UNHAPPY—GERMAN MINERS MAKE LESS THAN £1 A WEEK—THE HARD LOT OF THE GLASS-WORKER—GERMAN JOINERS GET HALF THE WAGES OF BRITISH AND WORK LONGER HOURS—THE MISERABLE CONDITION OF THE SHOEWORKERS—A REPLY TO PROFESSOR ASHLEY

BY

OUR BERLIN CORRESPONDENT

PROFESSOR W. J. ASHLEY of Birmingham has just written a very instructive little work,* packed with carefully compiled statistics, to prove that the German working man has improved his condition within the last quarter of a century. The purpose of the book, he says, is to clear the air in the fiscal controversy, and to show that the balance of advantage derived from any comparison of the conditions under which the German and British working man lives is by no means indisputably in favour of the Britisher. Professor Ashley seeks to prove that Germany within the last quarter of a century has witnessed a great advance in the well-being of the masses of her people, a period during which the Empire has been pursuing a policy of Protection.

I am, however, not quite sure that this point has ever been in dispute. No one seeks to controvert so obvious a fact. The masses of the German people have undoubtedly advanced in wealth and well-being during the last generation. Their wages are higher, their savings have enormously increased, the working day is shorter, and social legislation has done much to ensure them against accident and the disabilities of old age. To prove all this is hardly necessary, for it is knowledge we all possess. We also know that Germany during this period has pursued a policy of high tariffs. But what we do not know is, and what Professor Ashley has made no attempt to prove is, that this increased opulence and this improved condition of affairs is the result of a policy of Protection. The statement made by the Tariff Reformers is that Germany's workmen have become prosperous and happy because they are protected by tariffs, and that in order to bring about a similarly happy condition of affairs in England we must, in the main, pursue the fiscal policy which has wrought such wonders in the Fatherland.

But is Germany the workman's El Dorado? Is the German's prosperity so marked, his affluence so great, that we are justified in saying his lot is happier than that of the English working man? I believe it is not. Of his prosperity, as I have said, there can be no doubt, but it will take another quarter of a century to place him on the British level. His wages are lower, his hours are longer, his life is harder, his prospects are less bright, and above all and beyond all he is crushed to the earth by the burden of militarism, and by the class feelings of his race. German labour is still largely unorganised. The social democratic party has done wonders in helping on organisation, but there are still numerous large industries employing hundreds of thousands of men where organisation is lacking, and in which, in consequence, the workers' conditions are truly lamentable. The other day I asked a large employer of labour in Berlin, a man of the highest education, to what causes he attributed the advance in the condition of his workmen. His answer was remarkable: "In the first place," he said, "and in the second place also, the men have to thank themselves. They are now organised carefully in a union, and occupy a commanding position. Ten years or twenty years ago they were completely in our power, now they treat with us on equal terms. My workmen have been in no way affected by the high tariffs as far as their incomes are concerned, and it is absurd to say that tariffs influence wages. In some

* *The Progress of the German Working Classes in the Last Quarter of a Century.* London: Longmans, Green and Co. 1s. 6d. net.

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cases tariffs influence the purchasing power of wages, that is all." Professor Ashley himself does not attempt to say that the material prosperity of the German worker is due to Protection; he will be satisfied, he modestly says in one place, if he can show that Protection has not prevented a great advance. On this point we are agreed. Prosperity has been secured in spite of Protection.

In speaking of German prosperity we would arrive at far clearer views of the subject if we asked ourselves the question, Prosperity from what previous condition? If I have a thousand pounds a year in 1904, and one thousand and fifty in 1905, my income rises only 5 per cent. in the twelve months. But if my income is five hundred a year in 1904 and six hundred next year the increase is 20 per cent. Merely to say, therefore, that the British working man's wages have increased only 5 per cent. against 20 per cent. increase in Germany is in no sense illuminating, and conveys, in most cases, an utterly erroneous impression. Professor Ashley does not fall into this error to any great extent, but he lays far too much stress on percentages, and points to an increase of 50 per cent. in a workman's wages as conclusive evidence of prosperity, although the advance in weekly wages may be only from nine to 13½ marks. When this workman's wages were nine marks he was at the point of starvation.

In no single department of industry has Germany made greater strides than in the production of coal and iron. During the last twenty-five years the vast coal-fields of Silesia and Westphalia have been opened up to an almost incredible extent. Now how is it with the German coal miner? I have been among these men. I have been in their homes and spoken with their wives and children. If there is one class of men in the world more than another deserving pity it is the German coal miner. Added to the wearing nature of his occupation are the hopeless conditions which surround him. There is little to throw a gleam of light into his existence; he faces a weary round of exhausting labour. He bears his lot visibly stamped on his face. Pale, taciturn, apathetic, he spends his free time in dragging his relaxed body from one *wirthshaus* to another, or to the Socialist gathering where he can listen to his favourite demagogue. Every man of them is a Socialist. Is that an indication of prosperity? Do happy, prosperous, and contented workmen become the adherents of Herren Bebel and Singer? Not one in ten of them knows what Socialism is, but they do know that they are sick at heart, that their bodies are tired, that their wives and children are poorly fed and poorly clad, that there is nothing for them but ceaseless toil till they can toil no more, and they gladly join any political body which focuses their discontent into a striking protest against the capitalistic exploitation of the poor.

Let us look at the earnings of these men. The tables supplied by Professor Ashley are taken from the Board of Trade's *Abstract of Foreign Labour Statistics*, and are originally drawn from official German sources, but I do not think they give the exact earnings of this class of worker, and their accuracy is being constantly impugned by the miners themselves. The following figures are taken from the report of the Association of German miners published in 1903. And first of all the coal miners.

District.	Average (three years) income per annum.
Upper Silesia . .	850 marks = £42 10s.
Lower Silesia . .	820 marks = £41
Dortmund (Westphalia).	1200 marks = £60
Saarbrücken . .	1100 marks = £55
Aix-la-Chapelle . .	1150 marks = £57 10s.

Let us next take the iron-ore miners.

District.	Annual income (three years average).
Mansfeld . . .	900 marks = £45
Upper Harz . .	700 marks = £35
Siegen-Nassau . .	850 marks = £42 10s.
Left of Rhine . .	700 marks = £35
Right of Rhine . .	800 marks = £40

This is the average of the last three years, and there seem no indications of any improvement. It must be carefully borne in mind when considering the condition of the German working man, that whereas his earnings on the whole, as in the case of these miners, show little tendency to rise, the prices he pays for the necessities of life are mounting steadily. This is notably the case with his rye loaf. Recently imposed corn taxes will go, as they have gone all along, into the pockets of the agrarian land-owners, and nothing has embittered German working men more than those measures which have added to the duties on imported bread-stuffs. They know full well who will pay this additional duty. It is not too much to say that the recent addition to the duty on the people's bread has added half a million votes to the Social Democratic party.

It will round off this picture of the German miner if I state that in a recent report of the

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Government inspector of mines in the Palatinate this official says that a number of breweries and factories producing food have ceased work owing to the diminished purchasing power of the workmen's wages, and that another consequence of this is that the consumption of horse-flesh has increased. Another fact about the miners. Whereas only 1.29 of British miners in every thousand are annually killed at their work, the proportion is 1.42 in France and 2.19 in Germany. In Saxony 68 per cent. of the miners require assistance from the sick fund, and in the Rhenish provinces for every hundred miners contributing to the sick funds there are 124 cases of sickness. As a matter of fact there is strong reason to fear that the health of the German miner is growing feebler. This was the opinion expressed at the fourteenth general congress of miners held last year at Zwickau in Saxony. According to Dr. Hartmann, a Government sanitary official, there are 20,000 workmen suffering from worm disease in the Ruhr district alone. Professor Ashley has contributed some admirable tables illustrating various criteria of prosperity among German workmen, most of them showing the result of recent social legislation for the benefit of the workers. He proves conclusively that the conditions are growing better, and that vast strides are being made in a forward direction. But he does not contribute anything to show that the workman's life is happier, or that it has reached a high standard, and he certainly fails completely in connecting any of these improvements with the policy of Protection.

It is impossible to go to the same length in considering the condition of other great industrial bodies, but two or three industries mentioned by Professor Ashley as showing progress to a marked extent demand attention. The glass and bottle trade is one of these. We are told that this industry is leaving England and crossing to Germany. Let us look for a moment at the position of the German glass worker. There was a case tried not long ago at Dresden in the course of which it transpired that wages as low as three and five marks a week were paid in this industry. This is doubtless an extreme case, and I will not press it, but in Bavaria the glass workers consider themselves fortunate if they have full employment for six months in the year. Men's wages in Bavaria are in dull seasons as low as twelve or fourteen marks a week. Herr Discherl, an authority on this subject, says it sometimes happens that actual hunger rages among these unfortunate men. In certain glass factories in the Upper Palatinate the men are at work for 110 to 112 hours between Sunday 12 o'clock noon and the following Sunday at 9 o'clock P.M., an average of over seventeen hours a day. Let us compare this with the 46 to 54 hours a week of the British glass-worker, with his 40*s.* to 55*s.* wages. As far as I can ascertain the best paid men in this industry are the bottle-makers with twenty-one marks a week in winter and eighteen marks in summer. They work a ten hours' day.

The workers in wood and the allied industries deserve attention. The following table shows the trades grouped under this heading, the average number of hours worked weekly by each group, and the average wages earned.

Trade.	Hours per week.	Weekly wages.
Brushmakers . .	63 ..	18 marks
Turners . . .	62½ ..	19.50 ,,
Basketmakers . .	72 ..	18 ,,
Wheelwrights . .	61½ ..	20.50 ,,
Joiners . . .	70 ..	21.50 ,,
Various . . .	64 ..	21 ,,

These figures are, of course, averages, and extend to the whole Empire. In large cities, for example in Berlin, a joiner will easily earn thirty marks a week all the year round, and in Hamburg probably more, but in smaller places joiners' wages sink as low as seventeen and eighteen marks. Bear in mind that these are skilled workmen. I think I am well within the mark when I say that for fifty-four hours a week the British carpenter receives nearly twice as large a wage as his German colleague for working seventy hours. And this I can safely add. The British carpenter is a man cast on far superior lines. His interests are deeper and wider, his horizon more extended. I think too he reads more, and that his reading is of a more wholesome character. He is, moreover, not filled with the rancour and bitterness of the German Socialist carpenter. He is loyal, often Conservative, and in the majority of cases he is amenable to the gracious influences of the Christian religion. And when I make this comparison between the German and English joiner I would add other trades as well, masons and bricklayers, plumbers and house-painters, tailors and shoemakers. I have lived for years in contact with the German working man. He is, I believe, an unhappier man than the Britisher, his home life as I have seen it is not on so high a plane, he is far more bitter against the upper classes, he is seldom

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loyal, he is too often wholly irreligious. If I understand Professor Ashley aright he thinks the German the Englishman's equal in physical appearance. This is not my opinion, as far at least as the industrial worker, man or woman, is concerned.

The German shoe industry must not be overlooked. Professor Ashley does not say much on this division of his subject. All he mentions is that the workers of Cassel and Erfurt have had their working day reduced from ten to nine and a quarter hours. The conditions in this industry in many parts of Germany are almost incredible. In a pamphlet published in Nuremberg in 1902, I find the statement made that even in the most flourishing times the earnings are only sufficient to obtain the most ordinary necessities of life. In the large and busy commercial city of Nuremberg it often happened that even when working over-time the shoemaker was unable to earn more than fifteen marks a week, and in the majority of cases the earnings fell below this miserable figure. It is hardly likely that in the two years which have since elapsed matters have much improved. The pamphlet I am quoting from mentions ten and twelve marks as the weekly wages in smaller towns. The women workers come home at the week's end with eight, six, and even with five marks. These figures, of course, refer chiefly to the small workshops employing machinery to a limited extent. But even in the larger factories the average does not seem to be much above sixteen or seventeen marks a week. In the case of highly skilled men tending elaborate machines the earnings are, of course, higher, but these men are machinists rather than shoemakers. I almost fear to quote from a pamphlet before me published in Gotha entitled *The Condition of the German Shoeworkers, and Their Task for the Future.* It deals largely with what we would call journeymen, unmarried men out of their apprenticeship, but not yet masters. To work until ten o'clock at night is nothing unusual, and to work fourteen hours a day quite in order. To rise from their stool and fling themselves into bed, and to rise from their bed and seat themselves at the bench is their practice. Unremitting, unhealthy labour, feeding, sleeping, fill their lives—nothing else, no recreation hardly save the Saturday night's beer "Bummel." No wonder they fall into the snares of the Socialist agitator and vote red.

This Gotha pamphlet was published some years ago, and there is reason to believe that the conditions have since improved. But let us add 50 per cent. to the figures of the pamphlet, and even then we have results at which the British shoemaker would open his eyes. We get an average weekly wage in Berlin of nineteen marks, in Magdeburg of seventeen marks, in Lübeck of sixteen marks, in Dresden of fifteen marks, and in Dessau of twelve marks. What do these men, earning such wretched wages, eat? How are they clothed? What are their wives and children like? To their credit it must be said that the women are wonderful managers; and Professor Ashley's praise of the German workman's wife is not overdrawn. They are also patient, wonderfully patient and loving. The family eat potatoes, when they are cheap, lots of potatoes. They have a doggerel verse about potatoes:

'Kartoffel in der Früh',
Kartoffel in der Brüh',
Des Abends mitsamt dem Kleid.
Kartoffel in alle Ewigkeit."

'Potatoes in the morning,
Potatoes with the broth,
At evening in their skins,
Potatoes to all eternity."

Beef and mutton are not dear in most parts of Germany, pork is still cheaper, but they are seldom seen in the squalid homes of these poor shoemakers. Cheap sausage, in which too frequently there is a good proportion of horse-flesh, nourishes in a way, and they enjoy it mixed with plenty of garlic. The German shoemaker dies at an average age of thirty-three years, which is seventeen years less than the average of the well-to-do classes in Germany.

I would call attention to only one more group of trades—the textile industry. In the following tables I have made an attempt to give an idea of the earnings of the textile workers. First of all the men:

½ per cent. earn less than 500 marks annually
12½ per cent. earn from 501 to 600 marks annually
20 per cent. earn from 601 to 700 marks annually
25 per cent. earn from 701 to 800 marks annually
14 per cent. earn from 801 to 900 marks annually
25 per cent. earn from 901 to 1000 marks annually
2 per cent. earn from 1001 to 1100 marks annually
1 per cent. earn from 1101 to 1200 marks annually

The women are paid as follows:

40 per cent. earn from 201 to 300 marks per annum
25 per cent. earn from 301 to 400 marks per annum
25 per cent. earn from 401 to 500 marks per annum
10 per cent. earn from 501 to 600 marks per annum

Sixty per cent. of those employed in the

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German textile trade work eleven hours a day, and 10 per cent. work eleven and a half hours. In the large factories in Alsace, notably in Mülhausen, good wages are paid to spinners, in some cases as much as thirty marks a week, but the aggregate yearly earnings in these exceptional cases can hardly exceed 1400 marks. Happy are those workmen with a family of grown-up children. As early as the law permits they draft them into the factory.

But it is in Bavaria where the German textile worker is at his lowest ebb. Although Gerhart Hauptmann wrote his terrible "Weber" about the weavers of his native Silesia he has only to come to Bavaria to find material for another drama as overpoweringly painful. Aft r their eleven hours' work in the factory, man and wife return to their home and begin another term of labour, sometimes stretching to six hours. They do so to keep the family from starvation. And when work at last is over what is the rest they enjoy? From five to ten persons lie down to sleep in one room. The children who are too young to enter the factory are often sent to earn a few pfennige by selling matches or flowers. Are there any British textile workers who send their children to the streets with matches? It is bad enough in Bavaria and Silesia. It is little better in Saxony, where twenty-two of the twenty-five members returned to the Imperial Diet are Social Democrats, an infallible criterion of discontent and unrest seething below the surface.

I hope I have not drawn these pictures in too sombre colours. I am unconscious of having exaggerated or of having set down aught in malice. Professor Ashley's work is valuable as it shows that undoubtedly progress is being made; but what must have been the state of affairs twenty-five years ago? We must rejoice at the progress made, but is it progress as the British workman understands it? Twenty-five years ago half a million German workmen voted for the Socialists, a year ago three million Socialist votes were recorded. I lay stress on this fact as an indication that the measure of material prosperity, such as it is, which they have secured has not brought contentment or happiness in its train. There are numerous industries where skilled workmen earn good wages. Bookbinders and printers, compositors, paper-makers, electrical workers, several classes of engineers, &c., are well paid, especially in the large cities. There are also numerous philanthropically minded employers like Krupps of Essen or the Aniline Dyes Company near Mannheim, where the workmen are really prosperous and really contented, but these form only a minute fraction of the whole.

CRIME IN AMERICA

THE ALARMING INCREASE OF LAWLESSNESS IS ATTRACTING THE ATTENTION OF ALL SERIOUS AMERICANS—BRIBERY, CORRUPTION, INDIFFERENCE AND WIDESPREAD CONTEMPT FOR THE LAW

AN American newspaper, contemplating the growth of crime in the United States, recently remarked that were Mr. Bryce to rewrite his chapter on the law-abiding spirit of the American people as a result of his visit to America a few months ago, he would have a different story to tell. Two decades ago, when Mr. Bryce wrote his *American Commonwealth*, he was able to give the highest praise to the law-abiding spirit of the people. But now "the violence and the indifference to violence shown by our great cities," says the Chicago paper from which we quote, "are symptomatic of a great and rapid change that is passing over the country."

The alarming extent of this change is seen when the reader is confronted by such facts and figures as Mr. S. S. McClure presents in a recent number of *McClure's Magazine*. Briefly put, these show that at present there are four and a half times as many murders and homicides for each million of people in the United States as there were in 1881. In the twenty-two years from 1881 to 1902, the number amounted to 120,488, whereas if the rate of these crimes per million people had continued the same as it was in 1881, the total would have been only

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35,169. Again, the people in the United States to-day number fully half as many as in 1881, but the suicides number fourteen times as many. It is upon these figures that Mr. McClure comments. He prints opinions from representative and serious newspapers, upon the prevalence of crime and lawlessness thus disclosed, as well as some published statements of judges and citizens. The acting-Mayor of Chicago declared that to-day crime and the criminal form the greatest question before the people of the nation. One of the judges in Georgia declared from the Bench that more homicides were committed in that State than in the whole British Empire. In South Carolina, said another authority, the safest crime is the crime of taking human life. There is abounding evidence, said President Hopkins of Williams College, of an alarming increase in crime, of crime of every sort, but especially of the kind that undermines honesty, chastity, and respect for the law. In charging the jury at Montgomery, Ala, Judge Thomas quoted figures to show that the number of homicides in the United States for three years exceeded by 10,000 the number of persons killed upon American railways in the same period. Another Chicago paper points out that not only are robberies increasing in number in Chicago, but also the highwaymen are more bold and more desperate than formerly, and that there has been a marked and significant change in the character of these crimes during recent years. "Formerly the footpad rarely resorted to violence save as a means of avoiding arrest; to-day the robber's weapon is used to injure, maim, and kill." And here we may introduce a quotation from a private letter of our own, from an American city, bearing upon this subject—a letter written not with any special view to showing the prevalence of crime in America, but merely relating the following as ordinary incidents in the life of the city where the writer resides:

"Another case of graft in this county. Two coroners for the county of Wayne have been drawing thousands of dollars from the State by fraud. They would go to work and charge the State for doctors' examinations which never took place, and also charge mileage fees of sixty miles for witnesses who only had to walk about two hundred yards. And a lot of other charges which went into their pockets. The whole thing shows that the law cannot be right, which allows a man and his little machine to rob the State for six years.

"We also had an exciting shooting business. Two men were breaking into a store about eleven o'clock the other night, when a policeman happened on the scene. One of the burglars fired and shot the policeman dead. Then they made a run for it, during which one of the men turned round and shot down another policeman. All happened on one of the main streets. Then it is quite common for people to be held up on the streets at the point of a revolver and their money taken. Why, I often wonder, do these things, which are so common here, not happen on the other side oftener?"

With reference to this last point Mr. McClure, it may be noticed, has gone carefully into the question of whether America is itself wholly responsible for the lawlessness of its citizens, or whether, as some thoughtless people say, "it's the foreigner." He finds that according to the census of 1900, there were 10,356,644 foreign-born population in the country, and that out of that number only those from Russia (424,096) came from a country where there are more murders and homicides than in America; "and even in Russia," he adds, "the percentage but slightly exceeds ours." The other 9,932,548 came from countries where murders are not half as common and homicides are less than one-tenth as common as in America. "Furthermore, American States in which American blood is purest—Kentucky, for instance—have their full share of crime. So the record of murders and homicides in the various countries seem to show that foreigners in the United States acquire most of their disrespect for law after they come among us." Of this disrespect for law perhaps the most damning charge against the American system which must be held to produce it is that made by Chief Justice Charles B. Lore of the Supreme Court of Delaware, who spoke as follows at the session of the Universal Peace Union:

"Lawlessness pervades the land, unrest and discontent breed over-apparent prosperity. We have become the money centre of the world, but this has bred a feverish appetite for gold, with all its vulgar accompaniments. . . . We would call a halt upon our captains of industry who have brought our country to its present height of frenzied speculation. Plants worth only thousands of dollars are, by the magic of watered stocks and glittering advertisements, swollen into millions. Gigantic frauds are palmed upon the people as successful business enterprises. Our greatest financiers are racking their brains to circumvent the law and the people, and by lawlessness achieve wealth, being careful only to keep outside of actual violence and the common gaol. When

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their cunning evasions of the law are crowned with success all men are tempted to lawlessness. Captains of industry, how much of the unrest, the mob violence and the labour troubles of the time, have been bred and fostered by your methods? We ask for an answer!"

Among the many reasons given by various observers for the deplorable increase of lawlessness are: the dull indifference of the people, who do not insist that the laws be enforced; the extremely low conception of the nature of the State; the widespread contempt for law and authority; and the presence of political considerations in the administration of the police forces. From his study of the evidence and his knowledge of his country Mr. McClure himself believes that the following are the causes to which the present appalling state of affairs must be attributed:

"Governments are established and maintained chiefly for the purpose of protecting life and property. Is it possible for officials to prevent ordinary crimes who are selected and elected generally for reasons other than special fitness for their tasks, and frequently for the definite purpose of robbing the people who elect them? Can a body of policemen engaged in blackmail, persecution, and in shielding law-breakers make a community law-abiding? Can a body of policemen engaged in criminal practices prevent others from committing crimes? Can a board of aldermen who for private gain combine to loot a city govern a city well?

"We have described time and again the oligarchy which consists of these three classes:

"(1) Saloon-keepers, gamblers, and others who engage in businesses that degrade.

"(2) Contractors, capitalists, bankers, and others who can make money by getting franchises and other property of the community cheaper by bribery than by paying the community.

"(3) Politicians who are willing to seek and accept office with the aid and endorsement of the classes already mentioned.

"These three classes combine and get control of the party machine. They nominate and elect men who will agree to help them rob the city or state for the benefit of themselves and who will agree also not to enforce the laws in regard to the various businesses that degrade a community.

"We find under various modifications this criminal oligarchy in control of many communities in the United States. We find representatives of this combination in the United States Senate, among governors of states, state legislators, mayors, aldermen, police officials. We find them among men in business life—captains of industry, bankers, street-railway magnates. In short, wherever franchises or contracts of any kind are to be secured from a community, we find leading citizens in the ring to rob their own neighbours, managers of corporations bribing law-makers, lawyers for pay helping their clients to bribe safely, jurors refusing to render just verdicts.

"These men—bribers of voters, voters who are bribed, bribers of aldermen and legislators, and aldermen and legislators who are bribed, men who secure control of law-making bodies and have laws passed which enable them to steal from their neighbours, men who have laws non-enforced and break laws regulating saloons, gambling houses, and, in short, all men who pervert and befoul the sources of law—these men we have called Enemies of the Republic. They are worse—they are enemies of the human race. They are destroyers of a people. *They are murderers of a civilisation.*"

Reading these things it is impossible for any one not to call to mind that America is a country with a Protective tariff. We have in this Magazine from time to time published articles showing how the Protective tariff and the system of Trusts in America affect for evil the social life of a great people. We refer especially to two contributions, written as it happens by Americans, namely, the article by Mr. Ray Stannard Baker telling the sensational story of the notorious Labour "boss," Sam Parks (December, 1903), and the one by Mr. Chalmers Roberts describing the adverse influence of tariff law-making upon public life and private interests, and the poison thus introduced in the Legislature (November 1903). "As soon as the people get to know it, it will post," said a Texas man the other day to the present writer, referring to municipal corruption in the United States. The whole lurid tale of the bribery and corruption rampant in American cities has been told very ably and graphically by Mr. Lincoln Steffens in his book called *The Shame of the Cities*, recently published in this country by Mr. Heinemann; and this book, read in conjunction with the two articles we have mentioned above, will give to any one who desires to study the subject a picture of the baneful influences now operating in American life. We are glad to know that Mr. Lincoln Steffens is now engaged for *McClure's Magazine* upon a series of articles depicting American lawlessness and its causes. All well-wishers of the United States—that is to say, all the people of the United Kingdom—will fervently hope that his pen and the many other influences at work in the same direction will soon bring the American people to a realisation of their condition in this respect, and its causes.

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THE INDUSTRIAL USES OF THE PETROL MOTOR

A NEW ERA—FOR SMALL POWER-PLANTS THE PETROL MOTOR IS BEING EXTENSIVELY DEVELOPED—WHAT BRITISH FIRMS ARE DOING—THE APPLICATION OF THE MOTOR-ENGINE TO INDUSTRIAL, AGRICULTURAL, AND ESTATE USES, WHERE IT WILL SUPERSEDE ANIMAL OR STEAM TRACTION

ALTHOUGH the petrol motor has been brought to a high standard of reliability and efficiency, its development for purposes other than the propulsion of vehicles and boats has not been extensively practised, at least so far as this country is concerned. In France, however, it is being utilised for a variety of other useful industrial purposes, such as small power-plants, where the cost of installing suitable gas or other power-engines is too costly, or the amount of work to be carried out is not sufficient to warrant any expensive outlay.

Motor manufacturers in this country hitherto have not been in a position to develop the many industrial phases of the petrol engine; their manufacturing output has been taxed to the utmost to cope with the heavy demand for cars and boats. Recently, however, several of our leading manufacturers have turned their energies in this direction and many important installations with this type of internal combustion engine have been carried out. There is every evidence that the petrol motor will displace other systems of generating power, at least in small plants, in the near future. Its advantages are obvious. It requires but little attention, and does not demand that mechanical experience for its management which is necessary in the case of steam- and gas-engine installations. Furthermore, the initial outlay and cost of upkeep weigh advantageously in favour of the petrol motor, while the question of space occupied by the respective installations for their operation is also on the side of the latter type of engine.

In France the utility of the petrol motor has been developed to a great extent by the De Dion Motor Company, who have devised a number of complete installations of small power for various purposes, such as electric lighting or pumping stations. So far these combinations have not been carried beyond 8 h.p., which is advisable, seeing that beyond this power it is generally more desirable to instal a gas-engine or some other system of developing power.

These motor combinations are, for the most part, intended for operation with petrol, which, in the majority of cases, is more readily obtainable than other liquid fuels. For this medium of combustion it is especially adapted, owing to its great economy, the consumption averaging less than one pint per horse-power per hour, though paraffin can be employed with equal success. The main advantage of the internal combustion motor of this type is that its dimensions for the horse-power it develops are small, rendering the motor compact and of light weight, while it can be easily started whenever required, dispensing with any elaborate preparations.

These combinations vary from 1¾ to 8 h.p. The smallest-powered motor runs at 1600 revolutions per minute, while the other higher-powered motors run only at 1500 revolutions per minute. The higher power will supply sufficient current to light eighty-four sixteen-candle-power lamps.

The disadvantage of the De Dion installations is the very high speed of the motors, with consequent wear and tear, noise and vibration. A slow-running horizontal engine, like the Adams-Hewitt, possesses many advantages in these respects.

The salient advantages of these combinations are the small space occupied and their comparatively light weight. The 1¾-h.p. plant only occupies a space measuring approximately 40 in. long, by 20 in. wide, by 23 in. high, and weighs 450 lbs., while in the case of the 8-h.p. combination it is accommodated in a space measuring 5 ft. 2 in. long by 2 ft. 2 in. wide by 2 ft. 7 in. high and weighs 775 lbs.

For certain phases of work a similar combination is built on a portable trolley, so that the plant can be taken to any required point. In this case the plant has to be self-contained, *i.e.*, the petrol and water-tanks, &c., have to be fixed to the truck.

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The possibilities of such an installation are obvious. It brings the benefit of the electric light within the reach of the man of average means, who prefers the country to the city suburbs for his residence. The disadvantages of country life in respect of lighting are only too patent. Gas is more often than not unavailable, and oil, which under these circumstances is imperative, has many drawbacks, so well known that reiteration here is superfluous. Even in the suburbs where the electric main passes within reach of one's door it is far more economical to possess a petrol-electric installation. When it is considered that sufficient current may be obtained to illuminate a whole house at a cost of about twopence per working hour, the economy in comparison with the fourpence or sixpence per Board of Trade unit is apparent. Furthermore the simplicity and reliability of the plant are such that it can be easily maintained by unskilled labour, while very little attention is needed.

There is one important phase for which the De Dion motor has proved highly satisfactory —small pumping installations. In these combinations, either the rotary or centrifugal pump is connected direct to the motor. The combination is mounted on a portable base so that it can be moved from one place to another. The centrifugal pump is adopted in those cases where it is desired to remove a large volume of water to a limited height, though the range of action is designed for differences up to 23 ft. In the smaller horse-power installations the pump is driven at the same speed as the motor. Cooling is accomplished on the thermo-syphon system, the cooling pipe passing through the water reservoir and being there covered with radiating fins.

In the higher-powered motors driving larger pumps, constructed for lifting great volumes of water, only to a small height, a series of gear wheels are introduced to reduce the speed of the pump.

The range of action with these pumps is considerable, the output varying from 3500 gallons per hour with the 1¾-h.p. motor, to 24,000 gallons per hour in the case of the 8-h.p. engine, the lift varying up to a maximum of 23 ft. In the case of the rotary pump installations, while the output is considerably less, being only from 1300 to 11,000 gallons per hour, the lift in this case varies up to 65 ft.

Such an application as this promises to be popular, since upon country estates the need for an efficient pumping installation for a great variety of purposes is widely felt. It is no uncommon sight in country districts to see primitive means employed for the spraying of trees, irrigation, pumping supplies, and so forth. Fortunately British manufacturers have realised this deficiency and have now taken steps to see that these long-felt deficiencies are adequately catered for. One of the pioneers in this application of the petrol motor is Messrs. Merryweather and Sons, whose long experience with pumps, acquired during their construction of fire-engines, has served them in good stead. The result is that they have contrived a wide variety of pumping apparatus capable of fulfilling every feasible requisition. Many of the accompanying illustrations comprehensively demonstrate these ingenious developments.

One of the simplest installations of this type is that which is utilised for spraying and watering purposes in the Royal Botanic Gardens. It is a light portable apparatus with a tank of forty gallons' capacity. The pump is driven by a 2-h.p. bicycle motor and can deliver one gallon of water per minute at 60 lbs. pressure. Such an apparatus as this has illimitable use in nurseries or hop-fields. For watering or spraying purposes a high pressure of delivery is required. Every nurseryman knows the difficulties and time occupied in the watering of extensive areas of beddings and trees. The present arrangement of carrying out the work with either a hose or watering-cans is attended with many disadvantages. With the hose, in addition to requiring either the setting up of standards from the water-main at frequent points, or the employment of long lengths of hose which only have a short life, only one jet can be obtained from one standard. Hand watering by the can is laborious and expensive. With a petrol-driven pump, however, the field of operations can be covered in far quicker time, and requires only the supervision of a boy or other unskilled labourer. Another advantage it offers is that insecticide may be utilised as well, which is absolutely impossible with the hose. The insecticide is simply placed in the tank and mixed with the requisite proportion of water. Even with such an apparatus as this four jets may be obtained simultaneously. A more powerful appliance upon this principle is also in use at the Royal Botanic Gardens, where an expansive spray is desirable such as for watering extensive areas of lawns or lofty trees. This apparatus is portable but is of high power, the delivery of the pump ranging up to 3000 gallons per hour. This plant is available for a wider

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variety of purposes owing to the exceptional power of the pump.

One of the most common causes of complaint at many country houses is the difficulty of the water supply. The water is invariably present, but the pressure is so slight that the only means of raising it to an elevation for storage, for the immediate requirements of the house, is by prolonged manual pumping. An ingenious appliance has been designed to meet such exigencies as these. To instal conventional pumping machinery with its attendant gas or engine and piping to cope with this difficulty would entail an outlay of several hundred pounds. Owing to the fixed nature of such an installation it would not be available for any other work in any other parts of the grounds or estate, and for more than 70 per cent. of its time would necessarily be idle. With the " Waterspout " pump, as it is called, quite a large variety of work can be accomplished. It comprises a twin-cylinder engine, driving a pump which has a lifting capacity of 18,000 gallons an hour, and can raise it to a considerable height. Being provided with a drag handle, and weighing only a few hundredweight, it can be hauled to any desired point. Thus when the house reservoir has been filled it can be taken to other parts of the estate and turned to account for flushing drains, or general irrigation purposes. Consequently it need have no periods of idleness, filling tanks, so that it becomes a money earner throughout every minute of the day. For instance, every farmer is aware of the difficulties entailed in the emptying of a lake or pond for cleaning purposes. A trench or conduit has to be dug to draw away the water. With this appliance it would be possible to drain the pond in less time than would be occupied in digging the trench.

Already the petrol engine has been applied to fire-extinguishing, and in the most recent developments it is utilised for both the propulsion of the vehicle and the delivery of the extinguishing jets. But motor fire-engines have an article to themselves in this number of THE WORLD'S WORK. We need only notice here that the motor and pump mounted on a four-wheeled trolley is designed not only to be useful in extinguishing fire, but also, when not thus employed, to fulfil a number of services connected with farm work. When not required for pumping operations the pump can be thrown out of gear, and the engine used for general driving purposes. As it has a rigid foundation it can be coupled by belting to chaff-cutters, milk separators, butter-making machinery—in short any implements which do not require a large amount of power to operate them. The appliance is always in use, and the owner can never regard it as so much locked-up capital, depreciating in value through the lapse of time and not from wear.

Possibly no other branch of industry offers the same opportunities for the development of the petrol engine as agriculture. The British farmer under the stress of severe foreign competition is compelled to economise labour at every turn. Horse traction must be dispensed with to ensure profitable returns, and manual labour must be reduced to the minimum. The Ivel agricultural motor has solved the first problem and the petrol engine will likewise solve the second. We have already described in these pages the application of the Ivel motor to ploughing, reaping, and kindred operations. Further experience has shown, however, that its possibilities are far more extensive. The farmer can dispense entirely with his horses except for pleasure, and likewise steam traction engines which have hitherto been largely adopted for hauling and other purposes may go by the board. If the farmer has an agricultural motor it will perform every function that he is likely to require. Not only will it till his ground and reap his produce, but it will grind and cut it as well, and haul it to market.

With this machine every possible operation that is at present carried out by animal, manual, or even steam-power labour can be accomplished. Under the conditions now in vogue the successful farmer maintains horses for certain phases of his agricultural work and cumbersome traction engines for the more arduous tasks. The consequence is that the farmer has two sources of energy, but both cannot be fully occupied simultaneously throughout the livelong day.

The Ivel machine, however, is nothing if not versatile, and is now an absolutely reliable and economical implement. The powerful 14-h.p. motor with which it is equipped renders it efficient even when ploughing the roughest ground. Furthermore, the introduction of a motor of this type upon a farm entails practically no expense beyond the cost of the machine itself—a noteworthy circumstance in any scheme involving the substitution of animal by motive power. Any agricultural implement that has previously been utilised in connection with animal traction can be pressed into service, the only alteration necessary being the dispensing of the poles used when a team of horses

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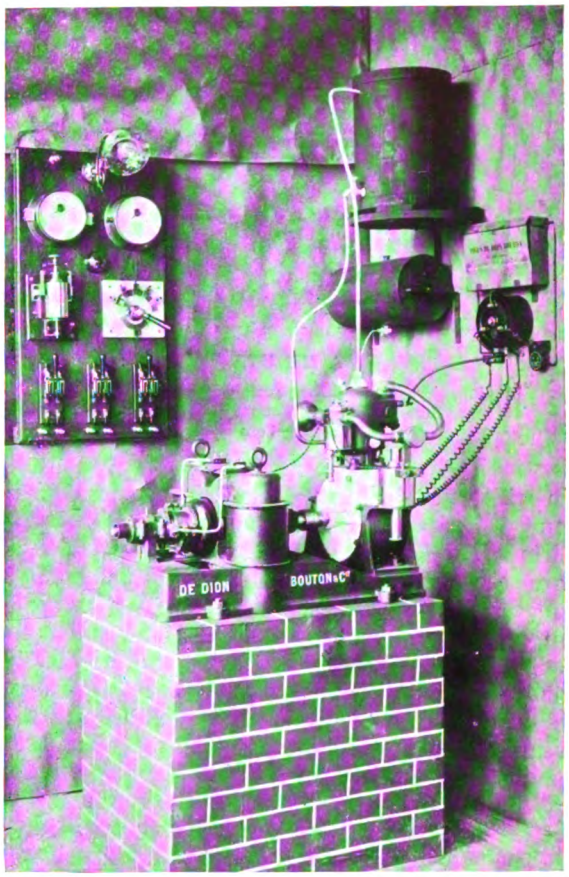
are hauling in lieu of a special inexpensive spring coupling.

For stationary work such as driving threshing machines, chaff-cutters, churns, and so forth, it constitutes an admirable source of energy. The power is transmitted from the engine direct through a pulley and belt. And the advantages of this system are obvious. It does not necessarily entail the cartage of the material to be treated to one common centre, which in the case of a stationary engine is the position, where the source of power is situated, but the motor can be taken to the scene of operations.

The petrol engine as compared, power for power, with the steam- or ordinary gas-engine is far more economical in operation. The following statistics which were obtained in some actual trials afford interesting and convincing reading upon this point.

A five-knife chaff-cutter driven by an Ivel agricultural motor cut 1 ton 1½ cwt. of chaff to a gauge of ⅜ in. long in forty-seven minutes. The work was accomplished at a total cost of 2*s*. 6*d*. which included petrol, lubricating oil, the men's time and other expenses. The quantity of petrol consumed amounted to three quarts one pint.

For threshing operations the cost works out a little higher, but the work it must be remembered is more difficult. Taken on the whole, the consumption of petrol averages



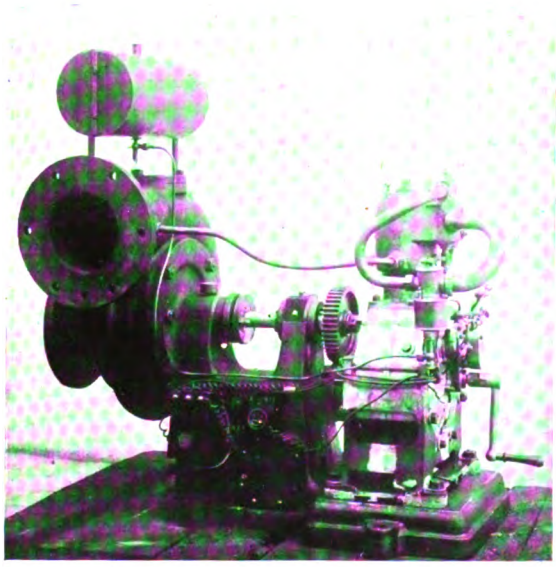
FOR SUPPLYING ELECTRIC LIGHT

A stationary combination of 8-h.p. petrol motor and dynamo. It develops sufficient power to light eighty-four 16-candle-power lamps

about 1½ gallons per hour, and estimating the cost of the fuel at 1*s*. per gallon this would amount to 1*s*. 6*d*. Lubricating oil would entail a cost of about 6*d*. per hour. The total cost of running, therefore, approximates about 2*s*. per hour, exclusive of the men's time. Any farmer who has had experience of other sources of generating power will realise the economy of this system of developing energy.

In the matter of haulage the economy effected is just as marked. The load can be double that hauled by a team of four horses, can be conveyed in half the time, requires fewer men, and a greater distance can be covered, so that the cost of transit is appreciably decreased. Developments tend to show that by the wholesale employment of the petrol motor the true solution of the agricultural problem will be found.

A further interesting application of the petrol engine is in connection with lawn-mowers,



FOR SMALL PUMPING-STATIONS

A combined petrol motor and centrifugal pump. It has a capacity of 24,000 gallons per hour, with a lift of 23 ft.

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FOR THE GARDEN—IT DELIVERS A GALLON A MINUTE

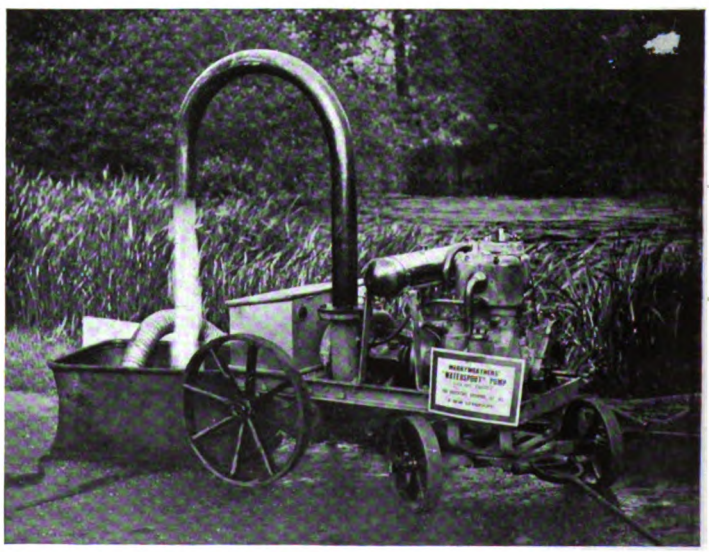
A 2-h.p. bicycle motor-driven portable pump in use at the Royal Botanic Gardens. The tank has a capacity of forty gallons

in which development Messrs. Ransomes, Sims and Jefferies of Ipswich, and the well-known firm of Thomas Green and Sons, Limited, Leeds, are the pioneers. The machine is equally adaptable for mowing an estate or cricket ground several acres in extent, as for a small country-house lawn. Simplicity, compactness, and facility of handling have been specially observed. The result is that but little skill is required in the operators. The machines are made in a variety of powers ranging from $2\frac{3}{4}$ h.p. to 6 h.p. according to the requisitions of the work which they are to carry out.

The smaller-powered motor is specially applicable for use on small grounds. The machine is fitted with a 24-in. cutting blade, and, in this case, the attendant walks afoot behind, with no other duty beyond attention to the mechanism, which is easily accessible from his position, and guiding. Even with this machine a large amount of work can be accomplished in a single day since the apparatus travels at the same pace as the man, while no time is lost in turning. In the hands of an intelligent gardener from two to three acres of grass can be easily cut in a day. In the higher-powered lawn-mowers the attendant is provided with a seat, from which point of vantage he controls the mechanism and steers the machine. Guiding can be carried out with the greatest nicety so that the grass can be cut round flower-beds without entailing any reduction in the speed of the vehicle. Furthermore the grass-cutting gear can be easily and quickly disconnected when desired, while the grass box can be emptied by a simple mechanical movement which obviates any need for the driver leaving his seat. The machine, which is fitted with a 4-h.p. engine, is specially designed for work upon undulating ground, such as golf links, while the 6-h.p. mower, which has a 42-in. cutting cylinder, is more suitable for work upon large level areas such as cricket grounds. The latter type is especially valuable since it can perform the dual purposes of cutting and rolling, a separate clutch being provided for throwing the cutting cylinder out of operation when rolling is desired.

The machine is self-contained and compact. The motor is cooled upon the conventional radiator system, ample cooling surface for which is provided, while the reservoir of water is carried in a cylindrical tank placed at the highest point of the machine. Owing to the many difficulties experienced in country places in charging accumulators, the Simms-Bosch magneto ignition is fitted.

One great advantage of the motor mowing machine is that it may be employed with equal success upon rain-sodden grass without in any way damaging the turf. Under such conditions a mower hauled by a pony is impossible, since the soft turf is damaged by the pony's feet. Again, with animal haulage a boy is necessary in addition to the gardener controlling the movements of, and steering, the machine.



FOR HOUSE SUPPLY OR FIELD WORK

A waterspout pump driven by 2-cylinder petrol motor, suitable for pumping water supply for houses, and for general irrigation purposes. Capacity 18,000 gallons per hour

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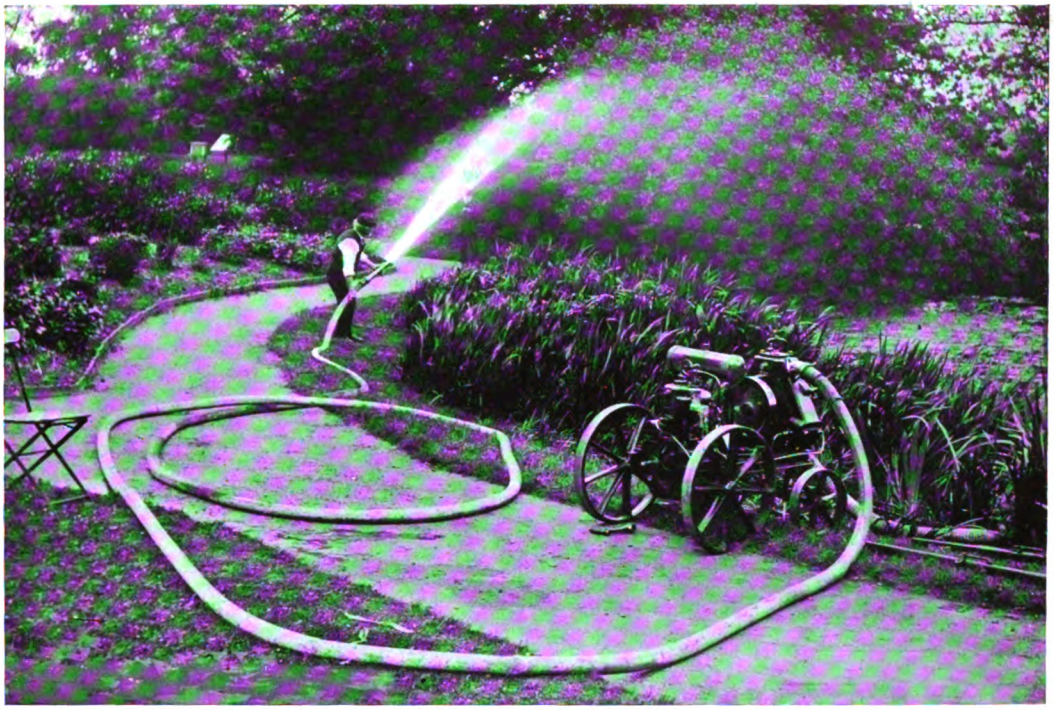

SPRAYING WITH A HIGH-DELIVERY PUMP AT THE ROYAL BOTANIC GARDENS

This pump is delivering 3000 gallons per hour

THE IVEL AGRICULTURAL MOTOR DRIVING A THRESHING MACHINE

The consumption of petrol is a gallon and a half per hour

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In the case of the motor-propelled mower only one man is needed.

Another important phase to which the petrol motor has been adapted is for tractive purposes upon ordinary railways. The usefulness of this system has been powerfully exemplified upon the North Eastern Railway, where a motor coach propelled by a 96-h.p. Wolseley motor is in operation. In this installation, however, the petrol engine does not drive the car direct, but serves to energise electric motors, which in turn propel the coach. At the Foreign Cattle Market at Deptford, however, there is in operation a petrol locomotive pure and simple which fulfils precisely the same functions as the ordinary steam or electric tractor. This petrol locomotive was constructed by the Maudslay Motor Company of Coventry, and serves to haul the meat cars over the lines that connect the City Corporation Meat Market with the main lines of the London Brighton and South Coast Railway.

This locomotive resembles the ordinary electric locomotive in appearance, the engine and mechanism being fully enclosed, to comply with the Board of Trade requirements. The motor is of the Maudslay standard type, having three vertical cylinders, each of 9 in. bore by 9 in. stroke, and it is capable of developing 80 h.p. on the brake, at 450 revolutions per minute. The ignition is of the high-tension type, with accumulators and coil. The locomotive is provided with petrol and water-tanks of sufficient capacity to carry fuel and water enough for a whole day's work. The motor is water-cooled and is supplied with tubular radiators having a large area; while, in order to ensure complete cooling, especially when travelling at a minimum speed with the maximum load up the heaviest gradients, a fan is also fitted to the crank-shaft. For starting purposes

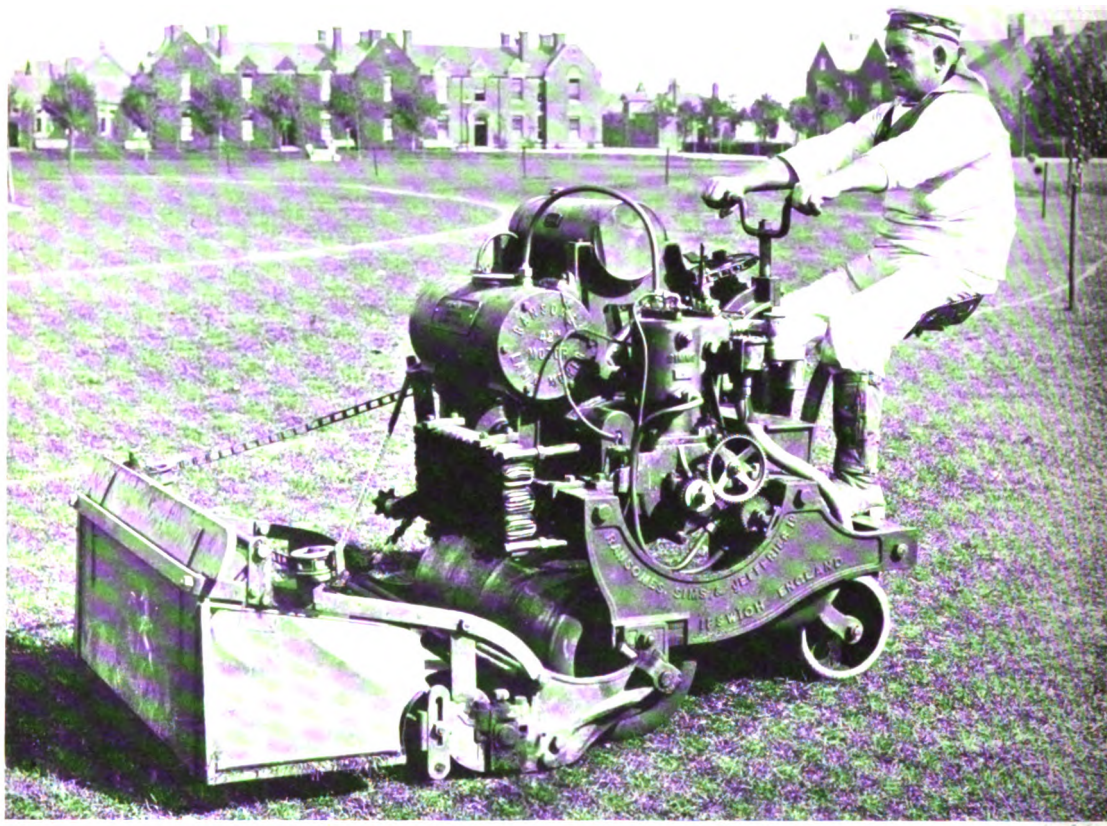

Photo by permission of Ransomes, Sims, and Jefferies, Ltd.

THE HANDY MAN DRIVING THE MOTOR LAWN-MOWER

This machine has lately been added to the equipment of the great Gunnery School at Whale Island

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an auxiliary, single cylinder, 8-h.p. motor is used.

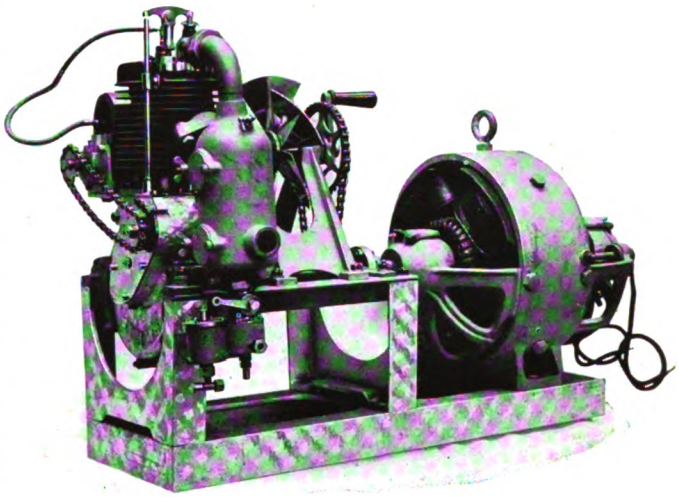
The class of work fulfilled by this tractor is especially arduous. The maximum load hauled consists of four cars, weighing when loaded approximately fifty tons. The track extends partly through the streets and markets and some stiff gradients have to be negotiated, the maximum being 1 in 36. The locomotive is geared to travel at a slow speed, two speeds forward and reverse of two and a half and five miles per hour respectively being fitted.

The braking facilities are adequate. These consist of ordinary hand brakes and Westinghouse air brakes for emergencies. In addition, there is also a sand-distributing apparatus to facilitate progress when the streets and track are wet and slippery. The weight of the locomotive complete is about twelve tons.

In the official trial carried out before the Board of Trade officials, the cars hauled by the locomotive were filled with stones, to bring them up to the contracted load of fifty tons. The locomotive hauled the cars over the system with perfect ease, and demonstrated that it could have hauled a heavier load and at a greater speed than that required. The trial included stopping and re-starting with the full load upon the heaviest gradients, and in every instance this was accomplished with complete ease and efficiency. The ease also with which the locomotive was controlled and reversed was very noticeable.

British engineers have been justified in their experiments in this direction, for many of our motor manufacturers have orders in hand for similar petrol locomotives from various parts of the world. There are many instances where steam is expensive and electricity is not available, and where owing to the limited work the installation of steam or electric locomotives is not justified, so that the petrol locomotive is peculiarly adapted. For such purposes, moreover, an engine of this latter type is far more suitable, and there are cases where the petrol locomotive will even supplant steam and electric locomotives that are already in operation, owing to its much lower initial expense, its immunity from breakdown, its easiness to operate, and its readiness for immediate work. (*See article on page 289.*)

A practical example of the economy it is possible to effect by the use of a petrol locomotive is afforded by the experience of the Richmond Main Sewerage Board at Mortlake. A narrow gauge railway runs through the grounds and the trucks were formerly hauled by a team of horses. The authorities then decided to supplant the horses by mechanical power. A six brake horse-power Blake petrol locomotive was acquired. It is fitted with two speeds both forward and backward giving five and seven miles per hour respectively. The experiment has justified the Board's action. With this engine a train containing 4½ tons can be hauled up a gradient of 1 in 30 while the load can be increased to eight tons on the level. The locomotive displaces the two horses formerly employed, at half the cost.



A PORTABLE SEARCHLIGHT PLANT COMPRISING MOTOR AND DYNAMO SUPPLIED TO THE WAR OFFICE

Recently the War Office acquired a combined self-contained petrol motor and searchlight plant. This interesting combination was constructed by the Simms Manufacturing company and comprises a 3½-h.p. Simms engine burning ordinary kerosene or petroleum, and a small dynamo. The whole is mounted upon a stationary bed, which, however, can easily be transferred to a trolley for portable purposes if desired.

The engine is equipped with the Simms-Bosch magneto ignition of the high-tension type. Air cooling is adopted, a fan being fitted for the purpose, while a particularly large exhaust box is provided to muffle completely the noise of the exhaust. The motor complete only weighs approximately 65 lbs., while its height is 20 ins.

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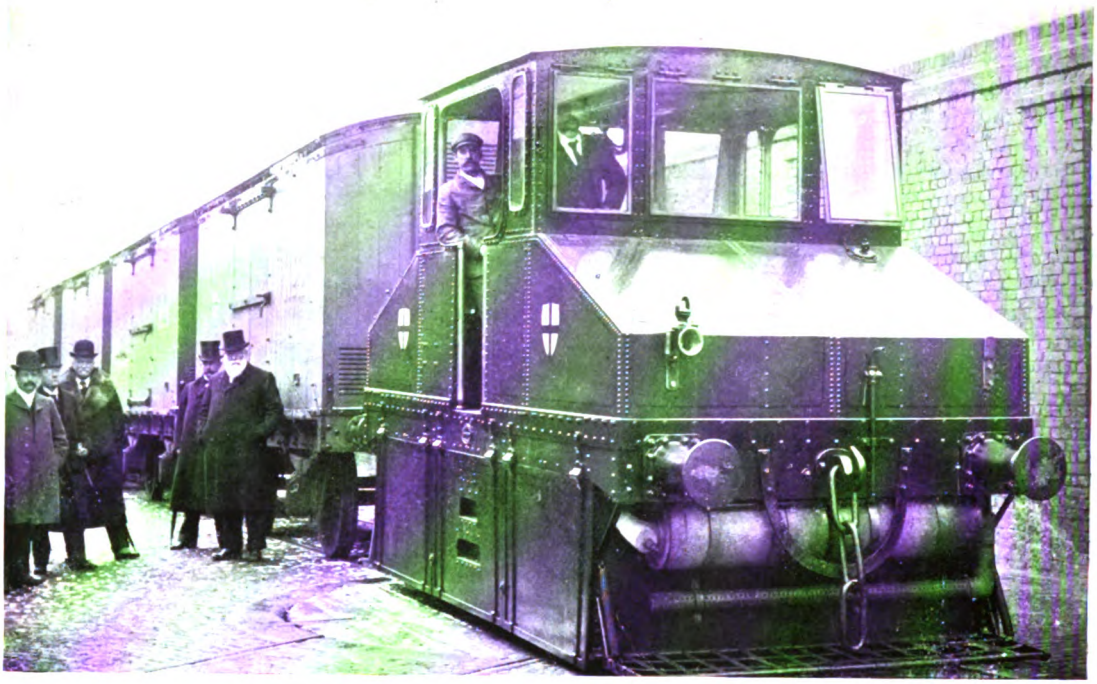
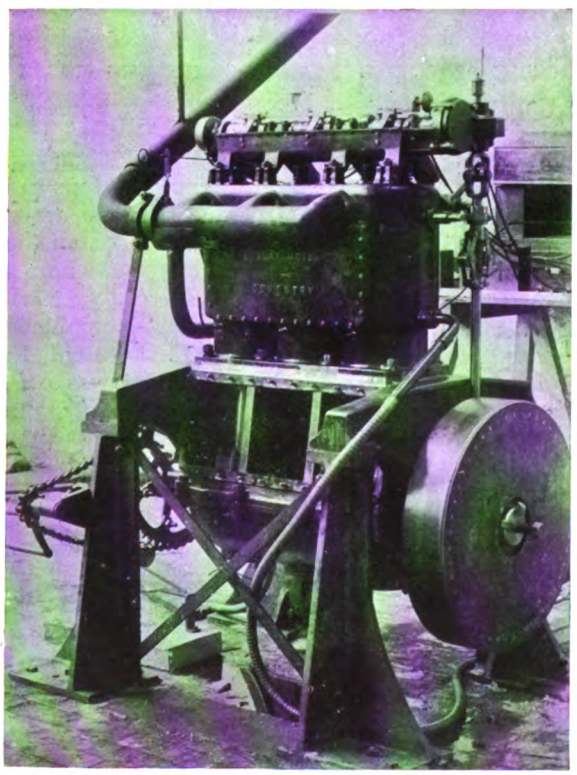


A PETROL LOCOMOTIVE USED FOR HAULING MEAT CARS

It is in use from the London Brighton and South Coast Railway sidings to the Cattle Market at Deptford



THE 80-H.P. ENGINE OF THE ABOVE LOCOMOTIVE

The combination was subjected to a six hours' test by the War Office authorities and the current developed after running for that period was sixteen ampères at seventy-five volts under full charge, the revolutions of the engine ranging from 1450 to 1500 per minute.

In this article we have described the most important applications of the petrol motor to services hitherto carried out by animal or other systems of power traction. So far, however, we are but on the threshold of an era which promises to mark as great an upheaval in the realms of commerce and industry as characterised the introduction of the steam-engine. Whether the petrol motor will entirely supersede the steam-engine is too large a question to discuss yet, but that it will come into vogue for small installations such as we have described there is not the slightest doubt. Suffice it to say that British engineers realise the possibilities of its development in various directions, and are now concentrating their energies on its application to these exigencies. A very simple 9-h.p. installation, with a horizontal engine, more compact and considerably cheaper than any at present available, is about to be placed on the market by an English maker.

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THE BROOKE 25 FT. RACING BOAT "BABY"

THE MOTOR-BOAT AND ITS FUTURE

A NEW SOURCE OF PLEASURE ON SEA, RIVER, AND CANAL—CHEAP AND SIMPLE TYPES OF MOTOR CRAFT EXPLAINED—HINTS FOR THE AMATEUR UPON FITTING THE MOTOR TO HIS OWN BOAT—MOTOR-PUNTING—THE QUESTION OF RACING—PETROL AND OTHER FUELS—FUTURE DEVELOPMENTS

WHAT is more delightful to while away an hour or two of a sunny afternoon than a spin upon the river at a steady five or six miles an hour, without the slightest fatigue? What the light car is to the road the small motor-boat is to the river. Unfortunately, the fact that a small-powered boat can be procured for a few pounds is not sufficiently realised by the public at large. The interest in racing, among boats propelled by engines of such elephantine power as 100 or 200 h.p., has distracted people from the main issue. These racing monsters and their achievements have received too much attention in the Press, while the real development of the industry, that which is to prove the most lucrative branch, has been passed over in a cursory manner (though not by the *Motor Boat*, the weekly journal which so ably records all developments of the industry and sport). Racing craft have a limited public, comprising those who are well blessed with this world's goods. But it is not this class that constitutes the mainstay of the industry. The backbone is that incalculable multitude described in the much-hackneyed phrase, "the man of moderate means."

It is fortunate for the industry at large that many of our manufacturers grasped the force of this, and while a few were devoting their energies to the development of speed, they were content to perfect a small craft, simple in construction, reliable in operation, and possessing the additional though equally important qualities of durability, strength, and comfort.

To many people, especially those within convenient reach of our rivers and canals, and at seaside resorts, the attraction of a spin upon the water is irresistible. Their ambition is to be possessed of a small motor-boat, but the question of cost is so much an inscrutable mystery that they hesitate and finally dismiss their desire as being impossible owing to the limited length of their purse-strings—though a large number of those same people spend from £70 to £100 in the acquisition of a tri-car. Such hesitancy, however, is not justifiable. A boat coinciding with their requirements can be obtained at the same price as the light road velocipede (as exemplified in the tri-car, quad, or small two-seated car) with this additional advantage, that whereas with the road vehicle there is accommodation for only two persons, in a boat of the same power five or six people can be conveniently and comfortably carried.

A small motor-boat can be purchased for any sum ranging from £40 to £100 or more. The former is about the lowest price for an efficient craft. If, however, the would-be lover of motor-boating already possesses a small craft and is anxious to convert it to

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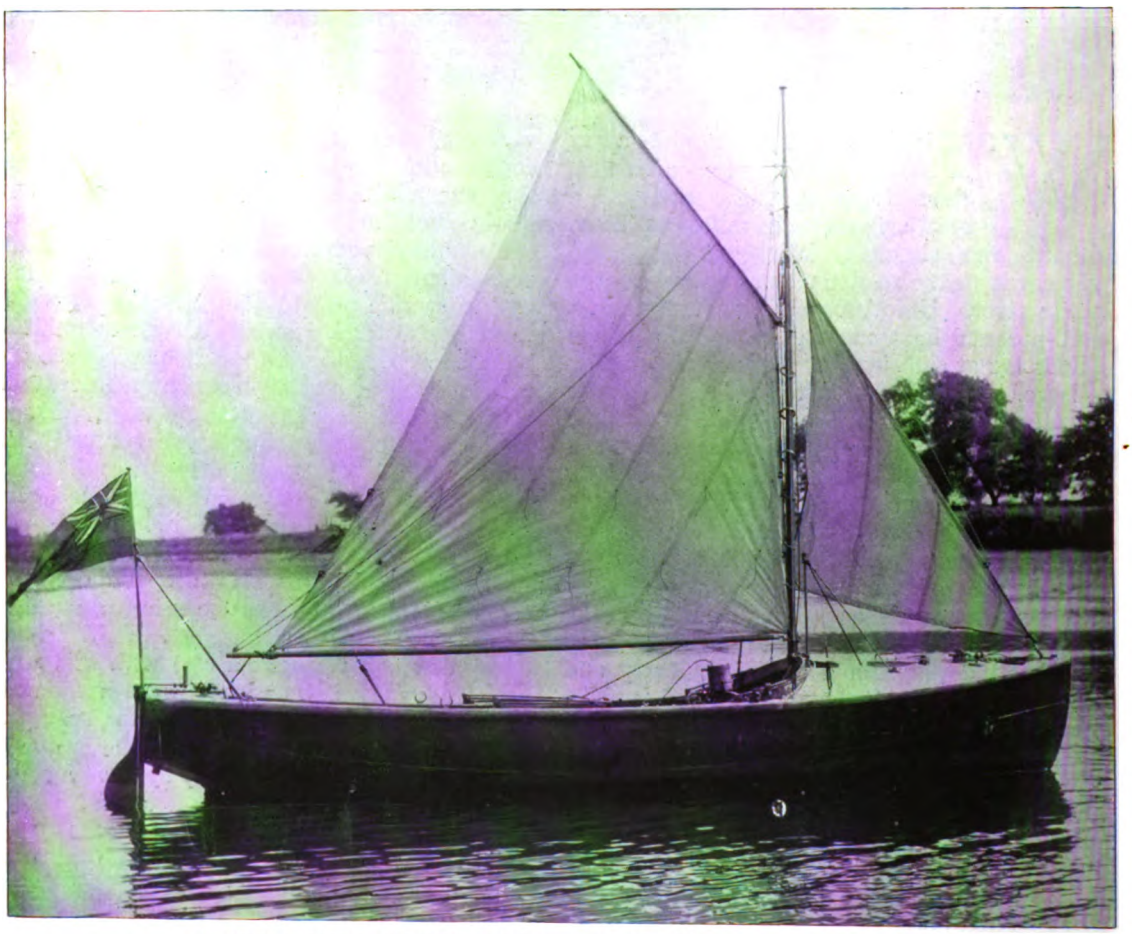
power he can acquire the installation from about £25 or £30 at the lowest, for it must be remembered that the boat itself constitutes no inconsiderable item in the total cost.

The development of the small-powered motor-boat has been in no small measure due to American enterprise. For many years past such craft have been plying upon the rivers and lakes of the United States. When the motor movement spread over this country the Americans entered the market with their already seasoned and experienced craft. But the English manufacturers proved more enterprising, and introduced, perfected, adapted a motor for this class of work with such energy that the Americans have been outstripped. The American engines are very efficient and were placed upon the market at a comparatively low price. But the modern English motor is a far preferable article. It is more up-to-date, more stoutly constructed, of better finish, and taken all round is more serviceable than the American engine.

One of the cheapest and at the same time most serviceable small-power boats in the market is the motor-dingy introduced by the Stirling Motor Construction of Edinburgh and Twickenham. The novel scheme of installing the motor may be gathered from the illustration on page 275, and any one who would like to avail himself of the motor-boat and who already possesses the boat itself can easily and cheaply adapt it to motor power upon these lines. The engine and practically the whole of its fittings are carried in a tubular frame. The motor, which is a 3-h.p. Fafnir, is practically slung over the rudder and lies in a horizontal position. The main advantages of the system are easy accessibility and the celerity with which the motor can be detached



A 27-FT. THORNYCROFT CUTTER, FITTED WITH 10-H P. MOTOR

The same style of craft, only propelled by steam, is used in the Navy, but is neither so convenient nor so serviceable

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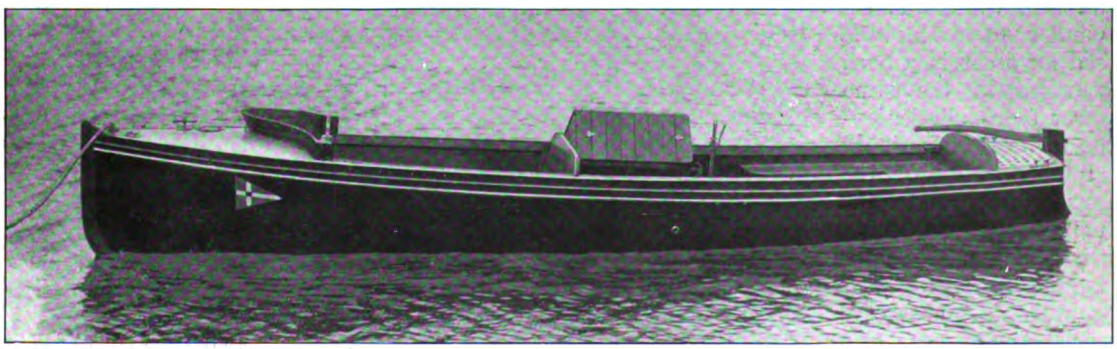
A MOTOR DINGY FOR RIVER OR SEA—15 FT., 4 H.P.

Recently placed on the market by the Brooke Company

when desired. The engine is held perfectly rigid, so that no apprehension need be entertained concerning lack of stability and derangement, since there is practically nothing to get out of order. The crank-shaft of the engine is carried down below the water level to a sufficient depth and terminates in a large bevel wheel, which there engages with another bevel wheel placed at right angles upon the short propeller shaft. For a tyro in motor-boating this constitutes an ideal craft as the whole arrangement is the essence of simplicity, while, at the same time, it is probably one of the cheapest combinations on the market.

The motor-boat has so many advantages over the simplest motor-car that a great many people would much rather boast a boat than a car. There are fewer integral parts, and less liability to breakdowns. There are no change speed gears about which to worry, nor differential gears to cause any anxiety. Moreover, there is less trouble in connection with the facilities for cooling the motor. Even the most careful motorist at some time or another has suffered from over-heating of his engine through the cooling water having entirely or nearly given out, either from oversight or the sudden development of leaks in the many connections. With a boat, however, these difficulties are overcome so long as the engine is fitted with a powerful pump. The driver does not have to husband his cooling medium after it has passed through the cylinder jacket, for he can discharge it directly into the water and draw fresh supplies from an illimitable source.

The fundamental components of a motor-boat are the motor; invariably a reducing gear, to reduce the number of revolutions of the engine shaft for the propeller shaft (since it is obvious that a speed of 1500 or more revolutions per minute in the engine is utterly unsuited to the propellers); the propeller shaft; and the propellers, together with reversing gear—though every boat is not fitted with the latter mechanism, the propeller simply revolving in a forward drive. The reversing gear, however, is invaluable, especially when



A PRIZE TYPE OF MOTOR-BOAT. PRICE £235

Eighteen feet yacht's tender. Built of mahogany or cedar, and fitted with 3-cylinder 15-h.p. Brooke motor, and capable of a speed of 9.5 knots. Winner of the Brooke Trophy at Oulton and the Godfrey Baring Cup at Cowes. Capital sea boats, and when fitted with spray hood fit to face almost any weather

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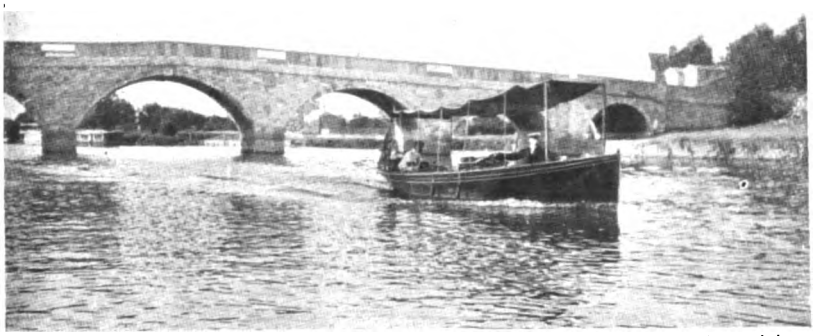

From the *Motor Boat*, by permission

THE "PETROLER" LEAVING CHERTSEY FOR A TOUR ROUND LONDON

Via the River Thames, and the Regent's, Paddington, Grand Junction, and Slough Canals—ninety-seven miles in 6 h.p. Daimler motor boat

it is desired to arrest the speed of the boat suddenly or to manœuvre, and is well worth the few pounds extra which it costs.

During the earliest days of the motor-boat it was the general practice to instal the same motors as were used for motor-cars. Owing to difficulties of a purely technical and scientific nature it was soon realised that this system was open to certain disadvantages. There were certain requirements demanded in motor-boat practice which the ordinary motor-car engine did not fulfil. For instance, it was found that the vibration set up by a motor, especially by a single-cylinder engine, was a serious question, and produced considerable strains. Manufacturers thereupon set to work to devise twin-cylinder engines of small power, and now while a single cylinder of 6 h.p. is used for a car, in a boat propelled by the same power twin-cylinder engines are invariably employed. One of the most serviceable launch engines the present writer has experienced is that known as the Scout, 6-h.p. motor constructed by Messrs. Dean and Burden, Ltd. It is a beautifully finished motor, and like several other English-built motors—contrary to the general opinion — is in every way equal to those of French or German production. The continental criticism about the English engines is that they are cumbersome and unduly heavy, but though this was true at one time, it is not so now. The Scout 6-h.p. motor is comparatively light, weighing only 165 lbs. complete, and is in every way compact and neat.

A launch fitted with one of these engines belonging to a shipping firm in the city has been submitted to some very hard wear and has emerged from it with conspicuous success. A month or two ago this launch was run from Chiswick to Hole Haven, 2½ miles below Thames Haven. She had stowed away on her some 10 cwt. of sails and other gearing, and carried three passengers. The distance from Chiswick to Hole Haven is about 58 miles, and this journey was done in 5½ hours, and for an hour and a half against a strong flood tide. Now an average of about 10 miles an

From the *Motor Boat*, by permission

MOTOR-BOAT FITTED WITH 2¾-H.P. PARAFFIN MOTOR MADE BY THE SEAL MOTOR COMPANY

She is 18 ft. long and capable of a speed of 5 knots

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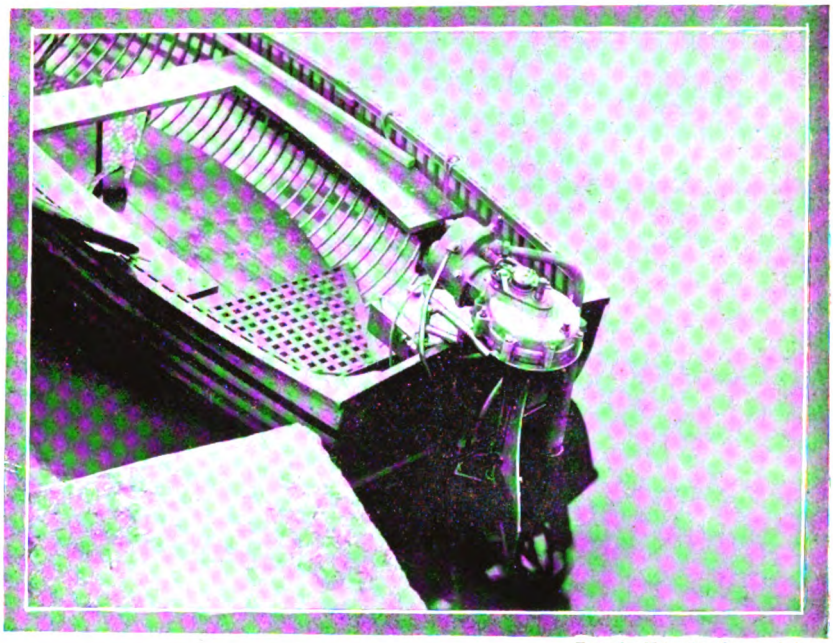
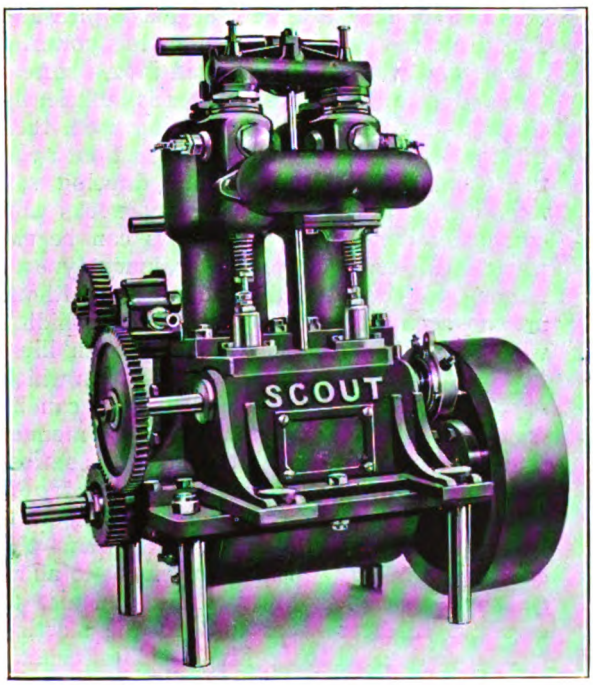
hour for a 6-h.p. boat is good travelling. Following this run the small craft was submitted to a passage from Burnham in Essex to Chiswick. The wind was blowing half a gale, and for twenty miles it was hard going, the boat battling in the teeth of the wind in a rough sea. But she behaved excellently, and though the engine was driven at its maximum power all the time she stood it well. A steam launch under such conditions on more than one occasion has given out.



From the *Motor Boat*, by permission

A SIMPLE, EFFICIENT, AND INEXPENSIVE METHOD OF FITTING A MOTOR TO A BOAT
(Stirling Construction Company, Limited)

Enterprising manufacturers are catering more and more for the needs of those who desire a small-powered craft, inexpensive to purchase and making no heavy demands upon the pocket for maintenance. The Brooke Motor Company, of Lowestoft, have recently introduced a 4-h.p. fifteen-feet craft which is highly creditable. It is not a toy, but a substantial vessel for rough wear on river and sea. Five or six passengers can be carried with ease and comfort. Built of larch, with mahogany top strake, and provided with a small deck forward, she is of smart and handsome appearance. A prominent feature of this vessel is that instead of the reversing gear of the propeller being contained in the boss of the latter, it is placed in the boat and combined with the engine. Thus a solid propeller is gained, and it is a distinct advantage. Hitherto this method has been somewhat more expensive, but owing to the facilities of production and the slight (if any) difference in the initial cost, it promises to come much into vogue. One of the most successful types of the Brooke products is the yacht's tender—a craft about eighteen feet long by four feet ten inches in beam and driven by a three-cylinder 15-h.p. engine. With this vessel 9½ knots can be easily run off. The 14-h.p river cruiser of this make is also a handsome craft. The fine line of the



THE DEAN AND BURDEN 6-H.P. TWIN-CYLINDER PETROL MOTOR FOR MOTOR BOATS

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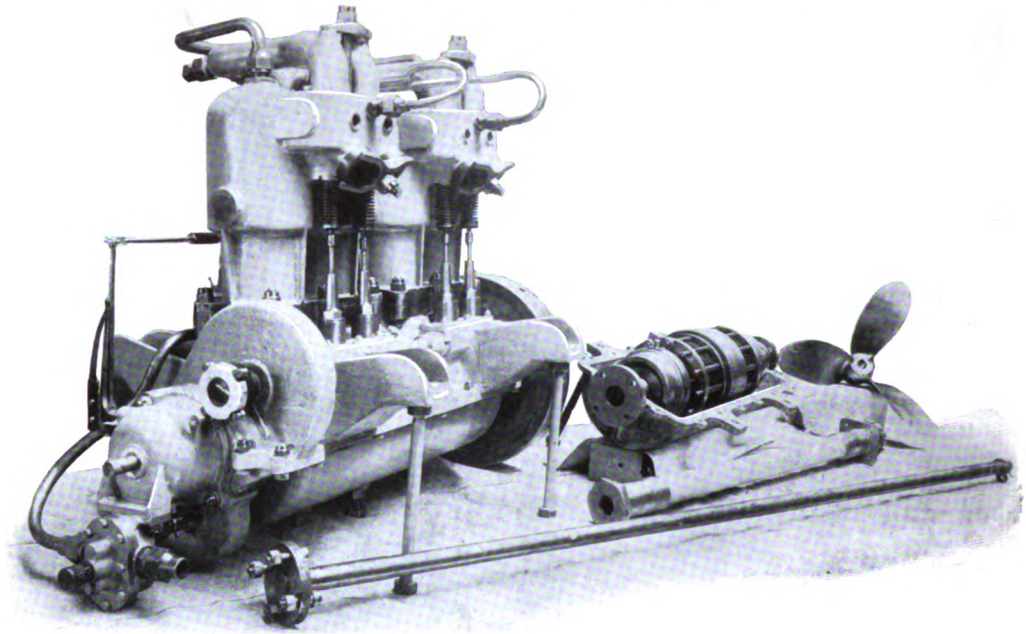

20-H.P. THORNYCROFT COMPLETE MOTOR BOAT INSTALLATION
Four-cylinder motor, reversing gear, propellers, and shaft

hull and the smart concertina top conduce to a smart *ensemble*.

In some quarters there is a strong antipathy to the motor-boat on account of possibility of fire and other accidents. This aversion, mainly due to the lurid newspaper descriptions of such disasters which have occurred to some racing boats, is quite a mistake. A motor-boat is no more exposed to the danger of fire than a motor-car. Certainly upon the latter the petrol, in the event of a leak, escapes upon the road and is lost, whereas in a boat it collects in the bottom. But in neither case should a leak be permitted to develop, or when it does occur, it should be repaired at once. Faulty insecure joints are invariably responsible for such leaks; and many amateurs neglect the immediate remedying of such a defect. In a boat extreme care against this contingency is imperative, or the occupant will dearly pay the penalty for his negligence. All fear of fire can be easily overcome by the exercise of cleanly and careful habits. The bottom of the boat beneath the engine should be kept scrupulously free from all accumulation, then no fear of fire need be entertained and the boat will be as safe from this danger as a car or a bicycle.

For the up-river man, where water is shallow, the punt is the best type of craft. But punting is a slow method of propulsion at the best, and does not conduce in a great degree to pleasure. Substitute the pole by a 4-h.p. or less powerful motor, and work is transformed into a recreation immediately. If the water is sufficiently deep to admit of a propeller being used, then this system of driving may be carried out upon the usual lines. With a punt drawing say nine inches of water the pretty nooks and corners of our leading waterways can be explored with ease, where the ordinary type of motor craft could not dare to venture without inviting such accidents as grounding or colliding with submerged obstacles. We give an illustration of an interesting punt installation which supplies a fair idea of how such boats can be converted to petrol power, and in such a manner as not to interfere with the general comfort of the boat. In this particular vessel the motor is of $2\frac{3}{4}$ h.p., which is ample for such craft. Owing to the limited depth of the punt the engine bed has to be raised somewhat to allow sufficient space for the fly-wheel, and also to give the engineer room to turn the starting handle without baring his knuckles against the floor of the boat. The radiating water after its passage through the cylinder jacket is discharged through the bottom of the punt.

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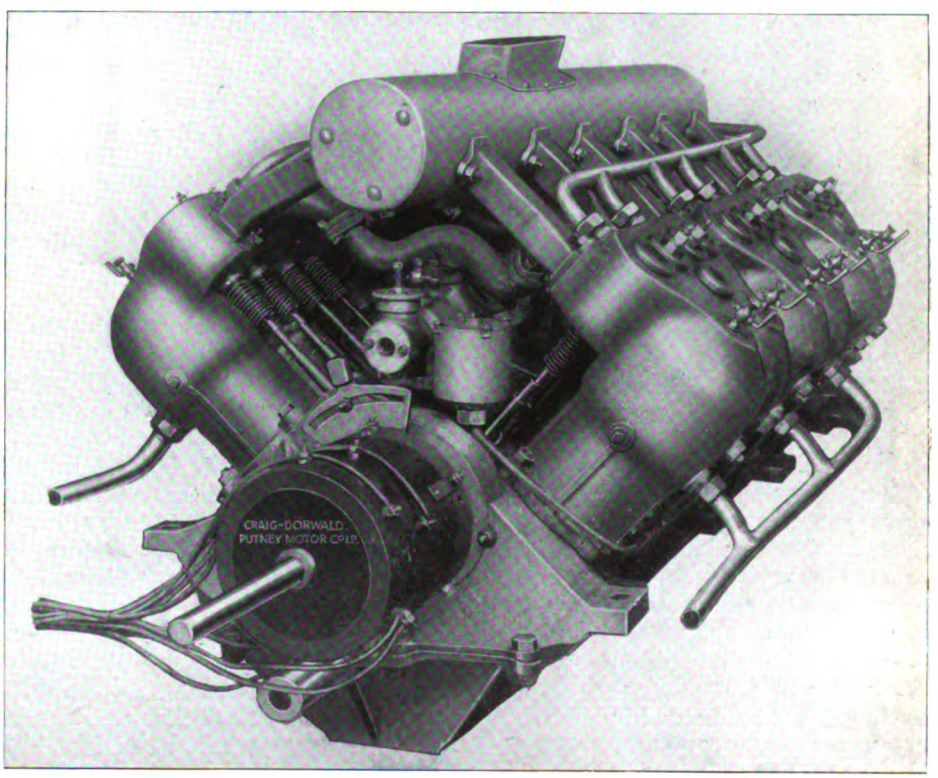
The whole engine is compact and occupies the minimum of space. The propeller shaft is continued from the engine beneath the decking and the exhaust pipe is carried to a muffler placed in the stern locker out of the way, the exhaust gases escaping below the water-line, so that the engine is rendered comparatively quiet. With this type of power-craft a speed of 6½ miles an hour is comfortably attained, and very little wash is caused. Such a power punt as this can be obtained for £75—which, as it includes cushions and all fittings may fairly be described as moderate.

For those parts of the river where the water is extremely shallow and the ordinary screw propeller cannot be adopted, some other system must be evolved. The easiest solution of the difficulty is to emulate the method of the shallow draught steamers plying upon various rivers abroad, and introduce a stern-wheel principle of propulsion. This has been carried out by a gentleman on the upper reaches of the Thames. The depth of water is very slight, yet this craft with a light load only draws four inches. The punt is fitted with a 3½-h.p. engine, and is carried on two substantial cross members to obtain the necessary rigid foundation. The stern wheel is three feet in diameter and the paddles are supported in a wooden frame. The wheel is driven by belting from a pulley on the engine, the speed of which —600 revolutions per minute—is reduced to 100 revolutions. At first sight this system of propulsion may seem somewhat primitive, but it has the advantage of being remarkably efficient, for it drives the vessel along at a steady six miles an hour, and tows another loaded punt with ease. The design of stern-wheel craft opens up a new field for motor-boat manufacturers, as there are innumerable instances where the ordinary boat is useless owing to insufficient depth of water, but where a shallow draught vessel is in earnest demand. Such cases should not be left to the personal enterprise of amateurs but should receive the closest attention of our skilled designers, who should contrive stern-wheel craft for the shallowest waters.

Perhaps some of our readers would like to construct their own motor-boat. It is quite feasible. There are many firms who supply component parts for such work—at a low figure too. Suppose you already have the boat, the installation of the power is not a difficult matter to a man of average intelligence, with the aid of the working drawings which are invariably provided with each set of parts. But a word or two in season may save a mass of troubles and difficulties. Unless the amateur possesses the rudiments of a technical knowledge he should not attempt any experiments.



A 12-CYLINDER MARINE PETROL MOTOR

The Craig-Dörwald. 150 b.h.p. This photograph is taken from the front and shows the ignition distributor and carburettor

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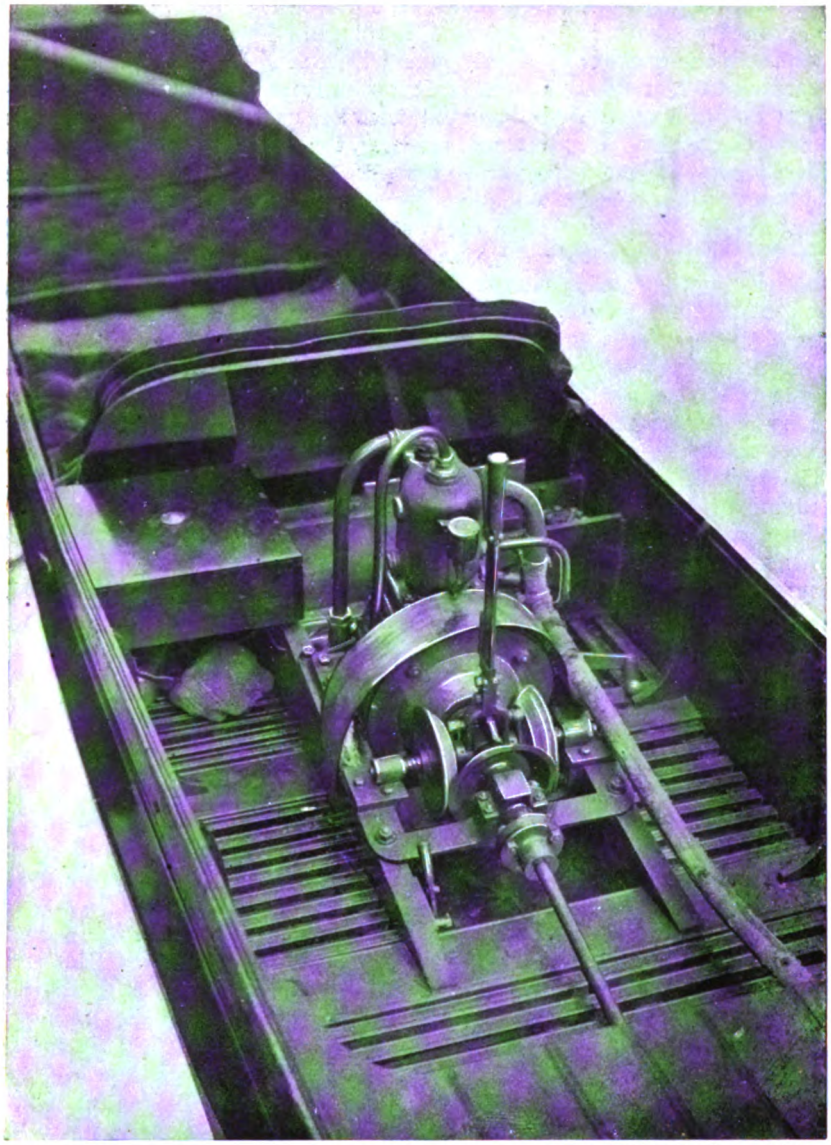

From the *Motor Boat*, by permission

AN INTERESTING MOTOR-PUNT

Showing how easily an ordinary punt can be converted to petrol power

When selecting the components, purchase them complete; do not buy one part here, another there, a third somewhere else, and so on. That is to say, do not patronise one firm for an engine, another for the reducing gear and shaft, and a third for the propellers. The present writer recently came across an amateur who had conceived the idea of converting his own boat to power. A mass of catalogues were procured. What could be simpler? B's propellers were cheaper than A's, though his engines were dearer. Result: A's engine was obtained and B's propeller, while the shaft was purchased from C. After prolonged difficulty the installation was completed, but the boat was as unique as the Ark. It had not occurred to the thrifty amateur builder that each purchase he had made was not in relation with the others. Both A's and B's motors were advertised as of the same power, but the absence of standardisation in the rating of petrol motors in this country had upset all calculations of the amateur, and although B's propellers were in proportion with their engines, when applied to A's motor there was endless trouble. (For the relation of the propellers to the power developed, their revolutions, design, and other innumerable details, are problems that have occupied and still occupy the foremost marine engineers of the day.) Therefore, let us repeat our advice to the amateur to purchase all the component parts from one firm, and profit to the utmost by the drawings and instructions that are supplied therewith.

One of the most interesting complete installations the writer has yet seen is that made by Messrs. Smart and Brown. Their set possesses an additional feature inasmuch as the engine, although developing only 3 h.p., is twin-cylinder. In proportion to its power this is the smallest twin-cylinder engine for motor-boat construction on the market. The advantages of such an engine are obvious. For instance, when installed in a small boat such as a yacht's dingy, the hull of which is necessarily of light construction, it is essential that the degree of vibration should be reduced

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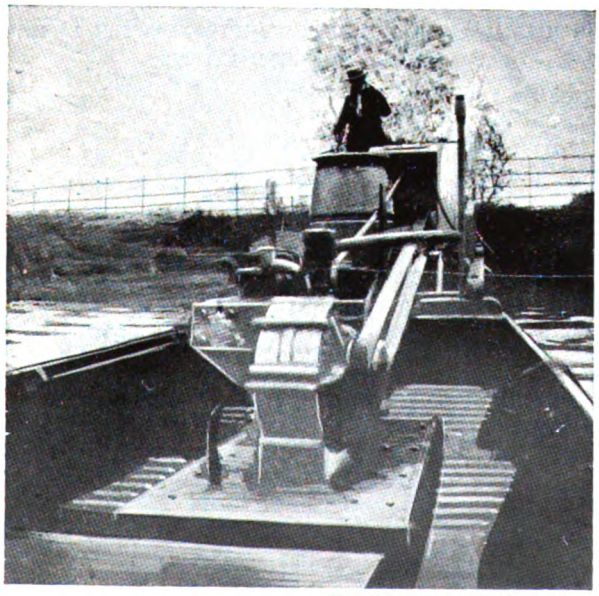
to the absolute minimum. In single-cylinder engines of the same power, the reciprocating parts cannot be properly balanced, whereas in the twin- and four-cylinder engines not only are the parts truly balanced, but the greater number of impulses serves to reduce vibration. This can only be appreciated by those who have had actual experience of both single- and multi-cylinder engines — such as in motor-cars, for instance. In this small motor each cylinder is of 2½ bore, with a piston-stroke of 2½. The cylinders are of the best cold blast iron; they are in one casting together with the water jacket, and are fitted with automatic valves. The fly-wheel is on the side of weight, thereby conducing to steady running, and also acts very effectively as a covering for the timing wheels. The propeller is of the two-bladed reversible type of eleven inches diameter. This firm also makes a similar outfit with cylinders of three-inch bore and three-inch stroke, as well as a four-cylinder engine of the same bore and stroke. This ingenious and efficient motor can be acquired together with propellers, shaft, &c., by the expenditure of a few pounds. For those amateur builders who have the inclination to machine and work up their own components, all the parts, castings, &c., can be procured in the rough. If the amateur has the time and has a few tools, such a course is the most commendable, since in machining-up and fitting the parts he becomes thoroughly familiarised with every nerve and blood-vessel of the machinery, and is never in a quandary when a breakdown occurs.

From the *Motor Boat*, by permission

THE MOTOR-PUNT "UPPER THAMES" GOING AT SIX MILES AN HOUR WITH FIVE PASSENGERS

Turning to the racing aspect of motor-boat development it may be asked what have these titanic struggles produced? At first sight it would appear, nothing. But the problem does not resolve itself into a mere competition in the construction of the most powerful engines, but opens up once more the vexed question of the correct shape of hull. Before the 1904 races the Napier Company carried out a number of interesting experiments in conjunction with Messrs. Yarrow and Company, the well-known shipbuilders of Poplar, as to the best line of hull. The construction of the latter is quite divorced from the building of the engines. This was conclusively shown during the course of the experiments, for the hull of the Napier winner in 1903 was found to be wanting in many points. The bow wave was considerable, as well as the wave from the stern. Repeated experiments with various types of hulls only served to emphasise the fact that the speed of a boat apart from the power developed by the engines is influenced to a very considerable degree by the lines of the hull. In contests in which the Napier boat, whose hull was designed upon the results of these trials, participated, the scientific lines of the hull aroused widespread comment. And it is now this question which will in the future command as much attention as the progress of the engines themselves and the Napier Company by this enterprise have accomplished more for the development of this system of propulsion from a naval point



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ENGINE AND GEAR OF THE "UPPER THAMES"

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THE "HUMMONO," SEA-GOING YACHT

Fitted with a 4-cylinder paraffin engine by Vosper and Company, Portsmouth

of view, than by all the races they have won. The Brooke boat, Baby II., also attracted wide interest, not only on account of its excellent performances, but owing to its fine lines as well. And the same may be said of the Thornycroft boats.

Turning to this year's programme it is interesting to learn as far as possible what is being done. The Napier Company has, as usual, decided to compete, as well as the Thornycroft and the Brooke companies. All these may be relied upon to give a good account of themselves, though whether they will triumph is a debatable point, as our foreign competitors appear to rely more upon boats engined with motors of 300 h.p. or more rather than the supply of moderate power to a correctly designed hull. For the blue riband the Brooke Company are building a forty-feet boat fitted with a 200-h.p. 6-cylinder motor. It is also rumoured that one of our leading naval ship building firms have in course of construction a forty-feet boat with which they anticipate attaining a speed of twenty-eight miles per hour. Should such be the case, then indeed will the race resolve itself into one between skill and scientific construction of the hull on the one side and sheer brute force of the engine power on the other.

One of the first of these racing engines to be constructed is the 12-cylinder Craig-Dörwald by the Putney Motor Company, developing 160 b.h.p. This engine possesses many notable features. The cylinders are ranged in two rows, six on each side. This company was the first

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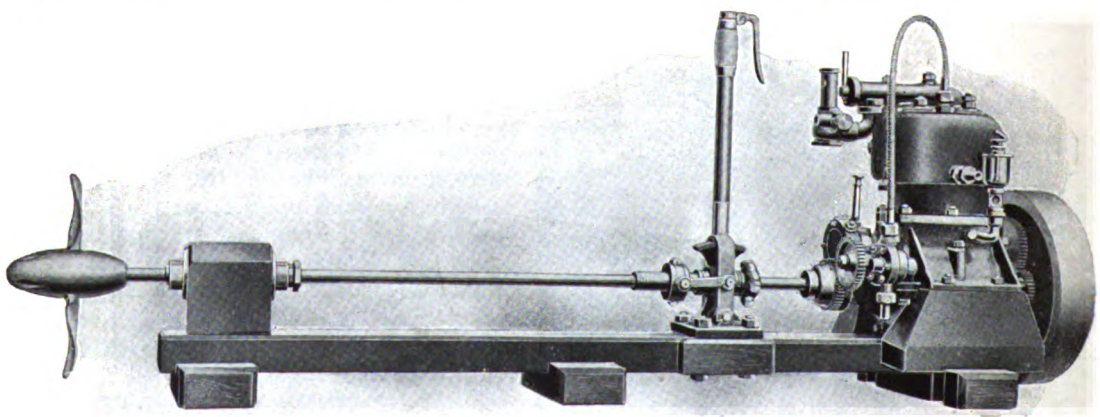
"PUFFIN," A 14 FT. DINGHY, FITTED WITH 1½ H.P. SEAL PARAFFIN MOTOR



THE SMART AND BROWN COMPLETE MOTOR BOAT INSTALLATION

The engine is of 3 h.p. and is the smallest twin-cylinder motor on the market

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to introduce an engine in which the crank shaft is set in advance of the cylinder axis. The main advantage derived from this arrangement is the reduction of shock and vibration, owing to the direct thrust on the driving stroke, while a distinct mechanical advantage at the end of the compression stroke is obtained. A few months ago when the new De Dietrich racers and Mors cars were placed on the road this departure was adopted, and was announced as a great feature of the engines, whereas the idea had long before been anticipated by this London firm. The 12-cylinder motor is fed from three automatic carburettors, and a novel distributing electrical ignition system is fitted whereby absolutely synchronous firing is obtained in the whole of the twelve cylinders. The same firm have also placed on the market an interesting and compact little set of 3½ h.p. for a small boat at a very moderate figure. They have realised, too, the far-reaching importance of standardisation of the various parts of their motors, and the result is that no matter what part may fail, either in a car or boat, it can be instantly replaced upon communication with the company. The higher horse-power motors are in reality only multiples of the single-cylinder type. That is to say, the parts of the latter are adaptable for the larger engines. This system is capable of considerable extension among our manufacturers. The firm's automatic carburettor is also a noteworthy acquisition to an engine. Not only is a perfect mixture claimed for it, but also a control of the engine with complete success at all speeds, and the separate engine governor, which, in the majority of petrol motors, is a constant source of trouble, can be safely dispensed with. The engine is the simplest at present on the market and the innermost parts are readily accessible. For instance, the gudgeon pins instead of extending horizontally through the piston walls are fitted with lugs which project through the piston head and are secured in position with ordinary nuts. The detachment of the piston is thus rendered easy and rapid, and there is no danger of the cylinder piston walls being scored when the gudgeon pins become worn and loose.

The petrol motor developments of Messrs. Thornycroft and Company are being followed with keen interest by all those interested in the future of this type of combustion engine, owing to the intimate experience of this firm with all types of speedy vessels of small dimensions for naval purposes. At the present time they have in hand the construction of a small boat fitted with a 75-h.p. motor for the British Government. The accompanying illustration of a 27-ft. cutter with a beam of 6 ft. 10 ins., draft of 27 ins., and a speed of eight miles per hour, is a typical example of the class of boat adapted to Admiralty requirements. The same class of craft, only propelled by steam, is already in extensive use in the Navy. In the latter vessel the machinery displaces 4.29 tons and develops 15 i.h.p. or 13 b.h.p. A petrol motor developing 10 b.h.p. has a displacement of 3.42 tons and gives a speed of eight miles per hour. But it is in the matter of space occupied by the machinery, and its weight, that the petrol motor scores, for whereas the steam machinery requires a space measuring 9 ft. in length and weighs 27 cwt., the internal combustion engine only requires a space 4 ft. 6 ins. in length and weighs only 13 cwt. The advantage in relation to fuel capacity is no less marked, for while 5 cwt. of fuel will only suffice the steam-engine for twelve hours, 3 cwt. of oil fuel will serve the petrol motor for thirty hours. The vessel portrayed in our illustration sets a fair spread of canvas. Owing to the smal space requisite for the accommodation of the engine and fuel there is much more room available for passengers. The weight of the boat, with the petrol motor, when loaded, is four tons, and sling plates are fitted to the keel for lifting. Sufficient oil can be carried for thirty-two hours' continuous running at full speed. For this boat the engine is adapted for the combustion of heavy oils such as crude petroleum of .82 specific gravity, and a flash point of 86 degrees Fahr. upwards. The consumption of fuel is approximately 1.1 lb. per b.h.p. per hour. An important feature of this motor is that the engine itself is reversible, so that it can be connected directly to the propeller shaft without the need of any reversing gear, and solid propellers can be employed. There is a reservoir which is charged to about 100 lbs. per square inch with burnt gases from the engine for starting and manœuvring. The gases are admitted to the reservoir from the engine cylinder through a relief valve, the pressure being slightly below that of explosion. A 3-cylinder engine is employed with the cranks set at 120 degrees so that there are no dead points.

This firm has devised a remarkable variety of petrol-propelled boats available for a wide range of operations from ordinary dingy and launches for pleasure work, to swifter vessels either for patrolling or the conveyance of a large number of passengers. The armed patrol

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boat should have a great future. It measures 92 ft. in length by 13 ft. 9 ins. beam, and has a draught of 2 ft. 7½ ins. The shallow draught and handiness of this craft render it available for many forms of work. The lines are similar to those of a torpedo-boat. The engines comprise two petrol Thornycroft motors, each developing 130 b.h.p. and capable of giving a speed of fourteen knots. Owing to the small space occupied by the engines, ample space is provided for the crew and other impedimenta. The armament comprises two 3-pounder guns mounted fore and aft, and two broadside Maxim quick-firers, together with a powerful searchlight. Taken altogether, the vessel comprises a formidable and highly useful fighting unit of her class for naval work.

The internal combustion motor, however, is in need of further development for the consumption of other types of fuel beyond that of petrol. This highly inflammable and volatile spirit is the most serviceable and satisfactory but it is not universally procurable. Its inflammable nature, moreover, renders its safe storage a question of great difficulty. Marine engineers have realised this, and the motor is being rapidly developed for the combustion of cruder liquid fuels, such as paraffin or heavy oils of very low specific gravity and not easily ignited. The design of an efficient motor for these grades of fuel is to be highly encouraged. It renders the engine more useful and the fuel can be stored with greater facility, as in bulk in the bottom of the vessel or other out-of-the-way places which cannot be utilised for other purposes; and it can be procured and used in tropical climates. One of the most interesting motors for this class of fuel is the Allsopp, which upon its introduction was hailed as a new type of internal combustion engine. The main distinctive features of this motor is that besides the working cylinder it has a small fuel vapour lamp which fulfils the novel function of a mechanically operated spray carburettor. The supply of combustible vapour thus supplied for the operation of the engine is therefore rendered independent of the suction of the working piston. The gas or vapour being supplied positively, the main air supply to the working cylinder need not be throttled for the purposes of converting the atomising mixture, so that a full charge of fuel is always present in the cylinder of the engine. This arrangement also ensures that nothing but vapour or gas enters the cylinder. Hence no trouble need be anticipated from the presence of condensed spray in the cylinder which is not consumed by the explosion of the charge.

Some remarkable results have also been achieved with paraffin in the Seal motor, and this little craft so fired attracted considerable attention on account of the complete combustibility of the charges by the engine during the reliability trials last year. Another interesting vessel is "Hummono," a sea-going yacht of 50 ft. length, 11 ft. beam, and 4 ft. 9 ins. draught, fitted with a four-cylinder paraffin engine by Vosper and Company of Portsmouth; she is fitted with two masts, and carries sails for auxiliary purposes. This engine at 350 revs. develops 30 b.h.p., sufficient to drive the boat at eight knots. The fuel consumption is only about four-fifths pint per b.h.p. per hour. The engine room, although it contains two fuel tanks of ninety gallons each, is most compact, being only 9½ ft. in length. Tube ignition is used until full speed is attained, so it is an easy matter to get the engine under way; once running, magneto electric ignition is used.

Should the progress in the development of the motor-boat during 1904 be maintained during the present year some remarkable results should be shown, and its application to many of those classes of craft now propelled by steam power should be extended in a very great degree. The question of the propulsion of small craft is now passing through a transitory and critical stage, from which the internal combustion motor on account of its numerous advantages should emerge triumphant.

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THE MODERN TRICAR AND HOW TO USE IT

A JOURNEY OF 400 MILES AT A COST OF FOUR-AND-SIX—MORE SOCIABLE THAN THE MOTOR-BICYCLE, AND CHEAPER THAN A SMALL CAR, THE TRICAR IS BEING PREFERRED BY LARGE NUMBERS OF PEOPLE—WORDS OF GUIDANCE TO INTENDING PURCHASERS

BY

J. VAN HOOYDONK

IF, even as recently as ten years ago, one had told any engineer interested in road locomotion that a vehicle weighing less than three hundredweight and capable of conveying under its own power two passengers and luggage from London to Edinburgh, would travel a distance of nearly 400 miles, in twenty-two consecutive hours, at a total cost for fuel and lubricating oil of 4*s.* 6*d.*, the statement would have been received very doubtfully.

Such a vehicle, however, we have in the modern tricar. On May 20, 1904, the Motor Cycling Club, a body which has done much to help the advancement of the motor-cycle, organised a run starting from London at ten o'clock one evening with the object of reaching the Scottish capital by 10 P.M. the following day. The only regulations were that each driver of either motor-bicycle or tricar should do any repairs he might require to do *en route* without any outside assistance whatever, and that the average pace should not exceed the legal limit of twenty miles per hour. Twenty-two motor-bicycles, or nearly half the number of the machines that started, reached Edinburgh within the required time, while of the seven tricars that attempted the journey only one, the Phœnix Trimo (my own make of machine) managed to accomplish the task. Again, in the great six days' trial organised by the Auto-Cycle Club in August last, consisting of a 1000 miles' tour through England, when eighteen motor-bicycles out of forty starters satisfactorily managed to cover the distance, only one tricar, and that a machine of the same make as the successful machine in the previous trial, came through the ordeal with the highest possible record. So far, on averages the tricar comes out decidedly the worst. The reason, however, is not far to seek. While motor-bicycles have been met with on our roads now for a number of years, and consequently have undergone a slow but natural process of evolution, the tricar as known to-day has only for a little over a year received the attention of the manufacturers. In the 1000 miles' trial for motor-cycles in August 1903, only one machine of the type was entered for the event, other manufacturers then hardly bestowing any attention on the coming type of sociable motor-tricycle. This machine, however, was found unequal to the severe task, and after completing the first day's run, about 120 miles, was withdrawn. The scope for the particular type was there, however, and another six months of thought and experiments worked wonders—as proved by the performances mentioned in the beginning of this article.

Now, tricars of various makes are a familiar sight on our roads; in many districts they outnumber all other motor vehicles. The comparatively low first cost, low cost of upkeep, speed and general handiness of the machine now being manifest, many manufacturers are devoting their energies to its production, and as a natural consequence the machines become more reliable and fit for the purpose every day.

Knowing that almost the first motor vehicle making its appearance in this country (the old Bollée), which was practically a two-seated tricycle, was soon superseded by the small four-wheeled motor-car and the motor-bicycle, how is it that the present-day tricar, which is practically a modification of this early type, should in its turn be preferred to the motor-bicycle, and in many cases to the small car?

The motor-bicycle appealed to a good many of us, being cheap, fast, and kept in going order at very low cost. The most enthusiastic rider of the motor-bicycle, however, finds at

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times that the nervous strain required to keep the machine from side slipping on a greasy road or on watered tram-lines, greatly discounts the pleasure to be derived from his mount when circumstances are more favourable, and wishes for a three-wheeler, which, although occasionally wagging its tail, will at least keep the right side up and not throw itself, with its rider, in the slimy surface of the road. Again, once the fascination of being one's own engine-driver has worn off, one soon begins to tire of covering miles of country alone. A companion is wished for. True, the pedal-bicycle in most cases carries only one rider, but to have a companion on a bicycle trip is entirely different to attempting the same means of sociability with motor-bicycles. It is difficult to make two machines travel at an equal pace, the speed is greater, and the engine makes a certain amount of noise: hence conversation becomes difficult if not impossible. Further, a good motor-bicycle costing from £40 to £50 finds a different class of buyer from a bicycle costing about a ten-pound note. That is, the average man who can afford the outlay is generally in such a position that the continual use of a motor-bicycle would make him appear selfish. In the tricar, then, comes the solution. For a ride alone the seat can be removed, giving a three-wheeled machine (the rider of which need not be continually on the look-out for a treacherous stretch of road), easier to steer, and on which a seat more comfortable than the bicycle saddle can be used. With the front seat in position the machine is fit to take his friend, wife, or even a couple of children for a trip or a tour. The cost compares favourably with the single-seated two-wheeled machine, while the attention to be devoted to keeping the "car" in order is not more than the average man can well manage.

Now if a vehicle is required to carry a passenger beside the driver, why not the light four-wheeled motor-car? Speed is one reason, cost is another. Strange as it may appear, the first item weighs almost as much as the second, although the latter is by far the more serious. Storage is another consideration, for many can store a tricar, the overall width of which is only 42 in., who cannot find room for the more bulky "light car." It has been proved that a tricar can, without being pressed, maintain an average speed of twenty miles an hour all through the country. It requires a fairly large car to equal this. The average 6-h.p. *voiturette* simply cannot live with it, and we can daily see tricars on the road overtaking cars costing four to six times the money. Now if speed touches one's pride, cost touches one's pocket, and for this reason we find a man who has had a tricar dispose of it in favour of a car, and again after having paid for experience rejoin the tricar fraternity. The average small car costs double as much as the average tricar in the first instance. This cost, however, comes only once. It is the upkeep in fuel and repairs, which never ceases, that cause the return to the tricar, where the motorist is in the unfortunate position to have to study expense.

We begin with the registration fee: A guinea for a car; five shillings for a tricar coming within the motor-cycle class; two guineas carriage tax, against fifteen shillings. Twenty-five miles on the gallon of petrol is good for a small car; tricars average seventy-five miles to the gallon, and in many cases a hundred miles can be covered on this quantity. Tyres have more wear, cost about four times the price to renew, and repairs are likewise all of a very much heavier nature, my experience among a large number of owners is that £1 a week is the very lowest upon which one can expect to keep even the smallest car going. On the other hand, to have the seats side by side is an advantage, the driver's seat on a car is, as a rule, more comfortable, and, in many cases, a car is easier to manipulate than its three-wheeled competitor, while in real bad weather one is better protected from rain and mud.

I have travelled thousands of miles on motor-bicycles, tricars, and small cars, and my favourite mount, leaving even cost out of the question, is the tricar. Given a good type of machine to start with, and devoting a little care and attention to keeping it in order, there is a delightful sense of freedom in driving a small machine with a companion aboard, a machine that will go through a narrow clearance in the traffic, pick up speed at short notice, overtake most of the vehicles on a country road, and enable one to cover a couple of hundred miles, if so inclined, any week-end. When arriving at the journey's end it has simply to be pushed in a shed or stable, without requiring the assistance or attentions of the yardmen, &c., who the moment one arrives in a car will not even open a door for less than a shilling tip. I have covered 1000 miles in six days and enjoyed every yard of the way.

Having stated that tricars are comparatively new, a few words for guidance may not be out of place. My ideal is a fairly light machine

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3½ to 4½ h.p. (not less than the former or more than the latter), air-cooled engine. Air-cooled engines have been proved capable of doing the work, and water-cooling means only added weight and trouble. Have it chain or gear driven; belts have been tried and abandoned. Two speeds—this is essential. The speed of the machine can almost entirely be regulated by the engine, the second speed or gear is chiefly required for hill-climbing; therefore, to enable any hill to be taken in comfort, the reduction in gear should be considerable—not less than 45 per cent. Front axle supported on springs, with separate springs for the front seat, and a well-sprung seat of a pan shape for the driver, very much like the type one sees on agricultural machines. Magneto ignition—this saves the worry of accumulators. The wheels should as much as possible be covered in with leather protectors to keep road dirt from driver and machine. Such a machine can be purchased at from £60 to £90. One hour a week will keep it clean and adjusted, and the total cost of upkeep, including fuel, should not exceed five shillings per week. It will take its driver, passenger, and luggage anywhere and at any time. In fact, if well handled it can be looked upon to take a load to its destination with the regularity of a train. In conclusion, however, I would mention that the machine being light and fast, requires a certain amount of agility to handle, so that for any one getting on in years it would perhaps be better to invest in a small car.

[Although he is himself a well-known manufacturer of tricars, we invited Mr. Van Hooydonk to write this article because he has probably had more experience of these vehicles than anybody in England. He would doubtless be the first to say that there are good tricars beside his own in the market, though, being human, he doubtless has his own idea as to which is best. His figures, however, of the cost of a small car are too high, and five shillings a week for "total cost of upkeep" of a tricar strikes us as too low.—EDITOR.]

"FRENZIED FINANCE" IN AMERICA AND ENGLAND

AMAZING REVELATIONS OF A "TIGERISHLY CRUEL SYSTEM" IN AMERICA—STOCK-MARKET MANIPULATIONS ON A STUPENDOUS SCALE—HAVE WE A SYSTEM IN ENGLAND?—TRAPS BY WHICH THE BRITISH PUBLIC MAY LOSE MILLIONS—WANTED, A POWERFUL SEARCHLIGHT ON COMPANY PROMOTERS

NEWSPAPER-READERS in England will have been seeing lately many references in inverted commas to "frenzied finance" and Mr. Thomas W. Lawson of Boston. So far, however, the English public, even those interested in finance, are very far from understanding the great importance and far-reaching effects of the publication, under this title, in an American periodical called *Everybody's Magazine*, of the most amazingly frank description of recent financial methods in the United States.

WHO IS MR. LAWSON?

Mr. Thomas W. Lawson has been for thirty-four years connected with finance, as a stock-broker chiefly, but also as a banker and "corporation man," a term which with us would mean a director of joint-stock companies. He is an extraordinarily clever business man of super-abundant energy and vitality, and has acquired a large fortune. He operates on an enormous scale, and is as well known as a speculative manipulator of markets as John W. Gates or James R. Keene. He has at various times been in close business relationship with the leaders of American finance, and has "inside knowledge" of the way things are worked in the world of *la haute finance*. He has the reputation of being unscrupulous in his methods and regardless of the loss and disaster that his raids and manipulations bring upon the public. But it is an axiom that no man can write a book without betraying his real personality, and if Mr. Lawson is to be judged by what he has written in *Everybody's Magazine* the true character of the man is clearly shown forth. Like many American business men, he has

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two sides—two codes of honour. He "plays the game," as he would probably say himself, but in the game of "stock-manipulation" he plays only with professionals, who understand and keep the rules and are quite prepared to let the devil take the hindmost. In personal dealings with his clients he is probably as honest as the majority of men—possibly more so. He would most likely say that the genuine investor cannot be injured by his manipulations of market values, and that the speculator by speculating makes himself a professional, knows, or should know, the rules, and cannot grumble if he gets hurt in such a rough-and-tumble game. Amongst other gifts, he has the knack of writing vigorous and racy English, and has shown in these articles an extraordinary lucidity and a power of presenting his subject in a closely reasoned and convincing manner that would do credit to a highly trained journalist.

Why is He Writing these Articles?

"Whosoever hath, to him shall be given, and whosoever hath not, from him shall be taken away, even that which he seemeth to have." During his thirty-four years' experience Mr. Lawson has seen the gradual growth of the enormous fortunes for which America is famous, and coincident with this has been the development of a system by which the power of these great aggregations of capital in a few hands is more and more used to increase these private fortunes by means of the money of the general public and at their expense. It is the callous and cynical methods by which this system is worked that have fired Mr. Lawson with the idea of telling the public how they are plundered, in order that once awakened they may by agitation and legislation put a stop to it. Mr. Lawson makes it quite clear that he is attacking the system, and not the men who work it. They are the result of a condition, and if they had never existed others would have done as they have. For years he has been contemplating this appeal to the public to protect themselves, but the instance of the working of the system that actually caused him to commence his task was the creation and flotation of the Amalgamated Copper Company. In this creation he had himself been concerned with Mr. William Rockefeller, whom he calls the "fly-wheel of the Standard Oil engine," and Mr. Henry H. Rogers, the "piston-rod" of the same company. Into the details of this scheme there is not space to enter here, but owing to various "dealings" the net result was that the leaders of the system made a profit of £7,200,000, and the public lost several times this amount. Out of this secret profit Mr. Lawson was offered as his share a proportion so small that he contemptuously refused it. This transaction, of which he makes no secret, has led, naturally, to the accusation that having been denied his fair share of the plunder he commenced this attack on his associates as a kind of blackmail. His enemies have spared no expense or trouble to prove that this was his object, but to a fair-minded reader it is quite evident that, though smarting under the unfairness of the way he had been treated, it is not a personal grievance he is ventilating. He considers that the public have been scandalously robbed, and that he was "let in" and made to appear a party to the transaction.

"Everybody's Magazine"

He wished to make a vivid appeal to the general public, and not to write a book on a highly technical subject, so he decided on publishing his work as a serial in a popular magazine. He made an arrangement with the Ridgway Thayer Company, publishers in New York, to issue his articles in a sixpenny periodical called *Everybody's Magazine*, which sold about 150,000 copies of the July number, in which appeared Lawson's preliminary announcement of his intention to tell the "Story of Amalgamated." The circulation of the Christmas number was over 700,000, and Lawson and his publishers confidently anticipate selling over a million copies monthly before the work is completed. The back numbers are sold out, so the "chapters that have gone before" are being separately reprinted. Each month Lawson exceeds his allotted space and continues in the advertisement pages, and also answers some of the criticisms that are showered upon him from every side. He exposes with extraordinary skill the misrepresentations and misstatements that are made about him. He seems to revel in fighting, and as far as the pages of the magazine go, he gets by far the best of the conflict. His publishers stick by him bravely, undeterred by threats of libel suits, and untempted by friendly offers to part with or suppress their magazine.

Lawson as an Advertiser

Mr. Lawson has always understood the sweet uses of advertisement. The English public know him as a man who built a yacht to defend the America Cup, which the New York Yacht Club, on a technicality, would not allow to compete, many Americans alleging

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that the real reason was his unpopularity with some of the leading financiers that controlled the club. Some years ago he gave £6000 to control the cuttings of a new carnation which became famous internationally as the "Lawson Pink." Recently he has brought himself more prominently before the City by cabling over advertisements of his opinions and advice on stock-markets which occupy whole or half sheets of a leading financial daily paper. In one of these advertisements he prophesied a slump in the stock-market, which, owing to there being an inflated account open for the rise, came off successfully. Another prophecy of the same kind was rather a damp squib, but Lawson said that to carry on this campaign against the enormous wealth of the men opposed to him, he must have dollars, and these advertisements designed apparently to move markets may only be to mislead his opponents as to his intentions or real position.

"The System"

What is this system, "this tigerishly cruel system," as he terms it? The capitalists known as the Standard Oil group form the nucleus. John D. Rockefeller, his brother William, and their partner Henry H. Rogers are the chief men concerned. This group practically controls the National City Bank of New York, whose head is Mr. James Stillman. This bank is the biggest financial institution of America, if not of the world. Then come the three great life insurance corporations, with their enormous assets and ever-increasing stream of the people's savings poured into their coffers as premiums—the New York Life, the Mutual Insurance, and Equitable Life Companies. Naturally, J. Pierpont Morgan's name appears as being one of the leading men of the "System," and also that of his partner, Mr. George W. Perkins, Vice-President and Trustee of the New York Life, and a Director of the National City Bank and the Standard Oil Bank. A comparison of the directorate of these companies and of the members of the various firms will show at once how close and indissoluble is the union existing between them. These companies also own and control various other important financial trust companies and gigantic industrial trusts. No one would complain of the mere power and resources of these men or their companies if that power were used fairly, but it is not. Proof of this is patent in Lawson's articles and remains uncontradicted. This has all along been recognised by those "in the know," but Lawson's articles are for the first time awaking the American public to a sense of the misuse of the power that these men and these corporations have over them—a power to which they themselves contribute by banking with the banks and insuring with the insurance companies, who use their deposits and savings as the instrument by which they are then cozened or cajoled out of their hard-earned money.

How the System is Worked

Take the case of the Amalgamated Copper Company. A group of capitalists buy up all the more important copper-mines of America for 39,000,000 dollars. They float off a company to the public for 75,000,000 dollars and clear 36,000,000 dollars profit. They then advertise that the National City Bank will lend 90 per cent. of the face value of the shares to any one who wishes to borrow on them. This is a banking transaction that would make our London banks hold up their hands in horror, but these capitalists control the National City Bank, and the public, seeing their biggest bank ready to lend nearly the face value of the shares, naturally conclude that the property must be very much more valuable. They rush to buy with borrowed money, the price rises sky-high, the underwriting capitalists sell out on them, the price collapses, the cover on the loans to the investing public runs off, the bank calls in the loans, the shares fall from 160 to 33, and then the capitalists buy in again. The operation is perfectly simple: it is as simple as an automatic shearing-machine for lambs.

Stock-market manipulation on this scale is a hazardous matter. To get rid of the millions of stock they control, the millionaires have to resort to what are known as "wash sales," or fictitious transactions designed to give a false appearance of strength to the market. These "wash sales" are against the rules of the New York Stock Exchange, but they are exceedingly difficult to trace out, as in all their more important transactions the big men make free use of dummies, and deal in other people's names. One man of a group, however, will sometimes work secretly for his own hand, and it is freely rumoured that one result of this last amalgamated affair will be a split between the Rockefellers and Mr. Rogers, of whose speculative transactions they are reported to disapprove.

An Important Side-Issue

Mr. Lawson has raised incidentally a very important point dealing with the great life

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insurance companies. The stability, soundness, and honesty of management of these companies should be beyond the shadow of suspicion. They are all under State supervision, and now a movement is on foot to alter this to supervision by the Federal Government, it being urged that the national and even international character of their business demands supervision by the very highest authority in the land. Policy-holders need have no fear as to the nature of the assets or the value of the policies of these American companies. No harm has been done as yet, and indeed since what is termed Mr. Lawson's "attack" on the New York Life, the company has secured a considerable increase in business. The publicity and increased attention drawn to certain points in the management of the business must be of advantage, but Mr. Lawson has quite rightly attacked a system whereby, however astutely it may be concealed, a single individual secures a profit which should in fairness belong to the company. Mr. Lawson suggests that underwriting commissions are taken by individuals connected with the company for underwriting amounts of stocks floated by the "System," which they are only in a position to underwrite owing to the certainty that they can secure the stock being taken off their shoulders by the companies they control. If this is the case, the matter should be sifted to the bottom, and such a thing made impossible in the future.

Again, the New York Life Insurance Company has a self-denying ordinance that the company can hold only bonds, and not the common stocks of any company. Mr. Lawson looks through their investments and declares that one of their bonds, of which they hold an unusually large amount, over 11,000,000 dollars, is a bond in name only, and really is the common stock of a railway company bought at an inflated price by "the System," which has been turned over to a convenient body called a Trust. This trust has issued what it is pleased to term "bonds" against the stock. This point should be thoroughly gone into. I believe the value of these bonds as an investment to be unquestionable, as they carry the joint guarantee of two of the most powerful railways in the United States, but the next transaction of this kind, once the principle is sanctioned, may not be so unquestionable.

Have We a "System" in England?

This is a question that it behoves us to look into very closely.

The answer would be that, speaking generally, in the sense Mr. Lawson uses the word, we have not. That is to say, our greatest English banks and insurance offices are independent, and are not controlled by a score or so wealthy capitalists. But in connection with South African mining finance, there is certainly a full-blown "system" in admirable working order, both in London and Johannesburg, with branches in Paris, Berlin, Amsterdam, and other centres.

"Standard Oil" can teach "De Beers" nothing, and the magnates of the Rand are past masters in the arts of "freezing out," "manufacturing public opinion," and manipulating stock-markets. What is wanted is some entirely fearless, unbribable, honest man who knows from the inside, as Lawson does in America, all that has been done in Johannesburg, Capetown, and London in the way of plundering the public.

Just as in America the pillars of the "System" are acknowledged to be, in their own homes, of blameless life, morally and socially, kind fathers and husbands, and philanthropic benefactors, so some of the pillars of the South African "System" here are in many ways among the best of men—kind-hearted, generous lovers of art, simple in their lives and tastes. Yet, either through loyalty to partners of lower standards of business morality, or because their "nature is subdued to what it works in, like the dyer's hand," the "System" seems to control them, and they are parties to a course of action entirely indefensible from the point of view of non-commercial morality.

A powerful searchlight should be thrown on the way companies are issued without a prospectus, in defiance of the well-meaning Companies Act as recently amended. Modern company-promoters drive their sixty horse-power motor-cars through Acts of Parliament easier and faster than their forbears did their traditional coach-and-four.

Even now traps are being laid and raids are being prepared by which the British public will lose millions of money, if they are not constantly and emphatically warned to beware, and if cosmopolitan stock-operators are allowed to over-ride the spirit of the law, whilst trumpeting forth their regard for the letter.

When we have all been told "how it's done," who works the "System," and who profits by it, as openly and completely as Lawson is telling the Americans, we shall have only ourselves to blame if our savings are crushed to impalpable powder between its upper and nether millstones.

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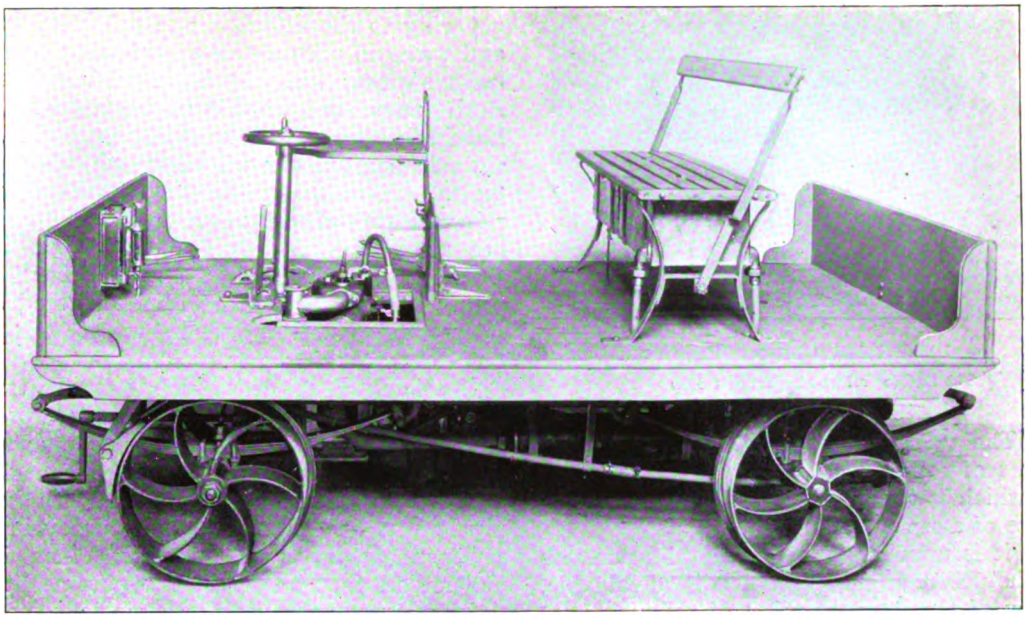
AN "INSPECTION" MOTOR-TROLLEY ON THE LONDON AND SOUTH WESTERN

It is 6 to 8 h.p., with accommodation for four persons. The cost of running is 5*d.* an hour



PETROL MOTORS ON OUR RAILWAYS

A NEW FIELD FOR THE MOTOR-TROLLEY—ITS VALUE FOR INSPECTION WORK ON HOME AND COLONIAL RAILWAYS—CHEAPER AND QUICKER—THE MOTOR-COACH FOR BRANCH-LINE TRAFFIC—INTERESTING DEVELOPMENTS

ONE of the latest and most interesting applications of the petrol motor is its employment upon railways for inspection operations by the engineers. For such work in this country at present a special type of small tank locomotive is generally employed. But as this engine has to be kept in constant readiness for service, a substantial expense is entailed in maintaining steam when standing by. While in operation two men are necessary, the driver and stoker. By the employment of a motor-trolley, however, the major portion of this expenditure can be easily saved. While idle such a vehicle does not eat its head off; it can start immediately it is required; and only one man is needed to operate it.

Such a trolley is now being operated on the London and South Western Railway. As will be realised from the accompanying illustration, the vehicle is compact and neat. It has accommodation for four persons, including the driver. The motor was constructed by the Simms Manufacturing Company, and is equipped with a single-cylinder Simms motor of 6–8 horse-power, fitted with the Simms-Bosch magneto ignition. The power is transmitted from the engine to the driving wheels by means of a friction clutch operated by a foot pedal in the usual manner. The trolley is provided with three speeds in either direction of six, fifteen, and thirty miles per hour respectively.

The trolley has proved remarkably efficient in operation, and enables the engineers to proceed swiftly from one point to another. The trajectory of the vehicle being supplied by the rails, the steering gear is dispensed with, and the driver's attention is solely confined to the speed control of the car. The braking arrangements are adequate and will hold the trolley upon any gradient. Practically the whole of the platform or deck of the trolley is available for the passengers, the petrol and water tanks being accommodated under the

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USED IN SOUTH AFRICA
The De Dion railway inspection trolley

seat. The vehicle is economical in operation, the cost of running being about fivepence per hour, which is considerably less than the maintenance of a steam locomotive.

But it is upon foreign and colonial railways that the utility of such a vehicle is so valuable, in view of the long stretches of railways that thread those countries. The possibilities of the vehicle for work upon such lines is illimitable. Small wonder, therefore, that some of our manufacturers are devoting their attention to the design of vehicles for this class of work. The De Dion Bouton Company have already despatched three trolleys to South Africa, the first having been sent out in May last for service in the district of Sir Lowry's Pass, thirty-four miles from Capetown.

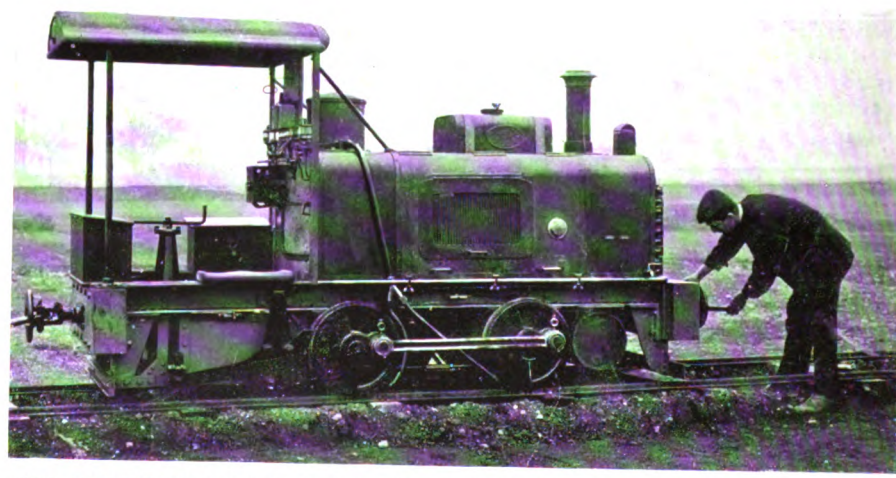
This trolley is propelled by a 6-h.p. De Dion motor, which, together with the gearing, is mounted upon a tubular frame. The wheels are made with tubular axles and spokes, ten of the latter to each wheel, with steel rims of sufficient width to run upon rails 120 millimetres wide, and provided with good flanges so as to secure a wide adhesion surface upon the metals. The change speed gear gives two speeds forward and reverse.

Owing to the difficulties of procuring petrol and water in such a thinly populated country, large supplies have to be carried on board. Both tanks are of sufficient capacity for two hundred miles, while in addition there is a suitable box fitted for holding spare parts and tools. And as the gradients upon these colonial railways are somewhat severe, special attention has to be devoted to braking. Upon these De Dion trolleys two band brakes are fitted, acting on the driving wheel and operated by a side lever, as well as a drum brake acting for the speed changing gear.

Upon arrival at Sir Lowry's Pass the trolley was submitted to the most severe work it is destined to fulfil. The pass is nine miles in length and is a continual gradient of 1 in 40. The trolley was laden with three passengers, but it covered the journey in fine style in twenty-seven minutes. When it is understood that the train takes from fifty to sixty minutes to cover the same journey, the merit of this performance is obvious. In the mile test, with a flying start, the trolley covered the distance in two minutes twenty-four seconds.

Some idea of the natural difficulties railway men in that district have to contend with may be gathered from the report of the engineer who carried out the tests.

"Against a strong head wind [he says] it is very hard work. Once or twice we have been almost



THE WOLSELEY PETROL LOCOMOTIVE CAN BE USED EITHER FOR INSPECTION OR HAULAGE WORK

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stopped by an extra heavy gust. The wind in this district at this time of the year is exceptionally heavy. The average speed for long runs is about twenty to twenty-two miles per hour.

"The average petrol consumption is about eight miles per pint, but I think that in future I shall be able to run ten miles per pint, as I have now found out the best mixture.

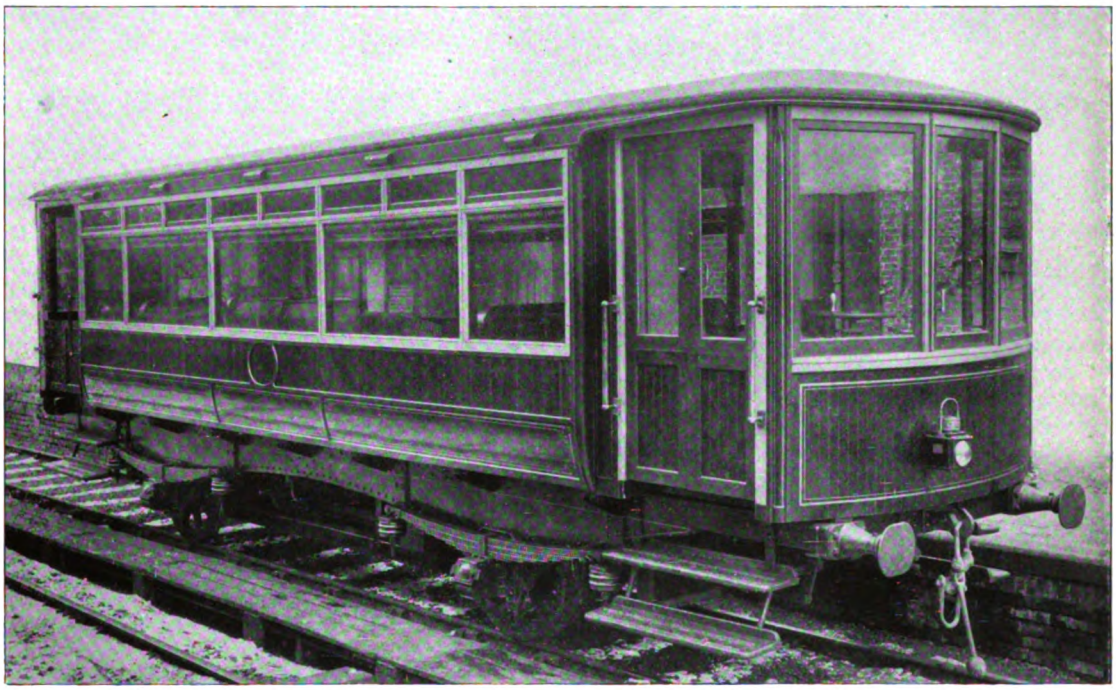
"The trolley has been the greatest success. All the engineers who have tried and inspected it have expressed their opinion that every district will have to have one, they being able to get over two or three times the amount of work at less expense. At present, unless a locomotive happens to be going their way, they have to travel on an ordinary platelayer's trolley, pushed by four boys at an average speed of six miles per hour, and a daily cost of labour of about 15s.

"A short while back I ran over a railing post, which is iron 1¼ ins. by 1¾ ins., which had been placed across the line, at about twenty miles per hour, without doing any damage. This has put a locomotive off the road before now."

From the above it will be realised that a great future awaits the motor-trolley in South Africa, and the same fact applies to many other colonies where the railways extend over hundreds of miles, and labour is expensive. In this instance alone it is possible to cover an immense mileage as compared with the antiquated hand-propelled trolley. With the motor vehicle the four boys are dispensed with, and a clear save of 15s. is effected. The petrol consumption of the car amounts to only about 1.275 farthing per mile—petrol costs 3s. 1½d. per gallon in South Africa. Contrast this running expense with the high cost of running an inspection locomotive in these districts!

Another interesting type of petrol locomotive, which, however, can be used for the dual purposes of inspection work and haulage, especially upon narrow gauge and private lines leading to industrial works and quarries, has been introduced by the Wolseley Tool and Motor Company. As will be seen from the illustration, in this engine the general design of the steam locomotive has been preserved, the chimney being ingeniously utilised for the dispersion of the exhaust gases into the air, while all noise is overcome by the employment of a large-sized muffler. This locomotive weighs three tons, and is propelled by a standard two-cylinder Wolseley motor developing twenty brake horse-power at 600 revolutions per minute, and fitted with a heavy fly-wheel to render it especially suitable to railway work.

The change-speed gear is of a heavier nature



THE PETROL-MOTOR COACH FOR BRANCH-LINE TRAFFIC ON THE GREAT NORTHERN RAILWAY

To run between Hertford and Hatfield. It seats 32 passengers, and weighs when loaded about 16 tons

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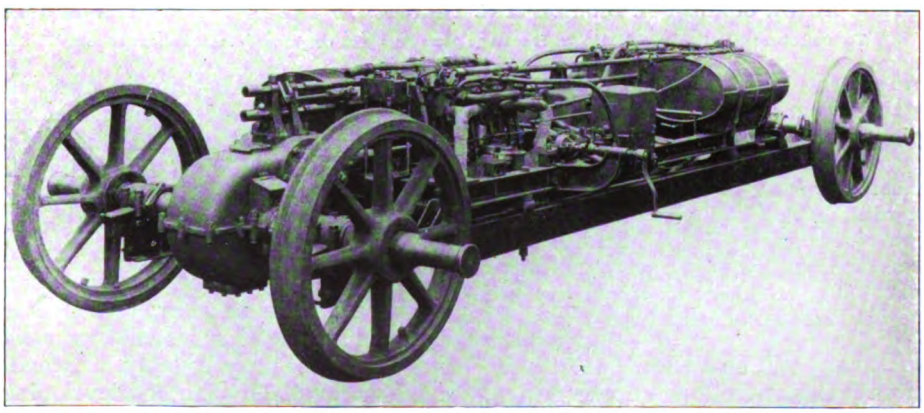
than that usually employed upon cars, and is fitted with two speeds forward and reverse giving speeds approximating three and eight miles per hour respectively. The ordinary cooling system is dispensed with, there being substituted in lieu thereof, a large ballast tank and a high-speed pump on the engine, which keeps the cooling water circulating through the jackets of the cylinder. The engine carries a petrol supply of ten gallons, which is sufficient for the engine when working at its maximum power for ten hours. The driver's seat is placed sideways on the near side.

Owing to the high engine power of this locomotive it is admirably suited to tractor work, being capable of hauling a load ranging from twenty to twenty-five tons.

The Great Northern Railway are at present carrying out a series of trials with a motor vehicle which is driven direct by the petrol engines. The design and construction of the vehicle have been carried out by the eminent engineering firm of Messrs. Dick Kerr and Company, Ltd., The whole of the machinery, weighing two tons, is carried upon a substantial steel frame directly supported upon the axles of the wheels. The practice generally followed in the construction of tramcars, where two electric motors are employed, is adopted, there being two petrol engines. The engines are connected through independent clutches to a common change-speed gear box, from which the power is transmitted by means of the longitudinal driving shaft into gear boxes suspended on each axle, and at this point the engine speed is reduced as required on the axles by means of a single reduction gearing similar to that used in electric tramway motors.

The engines were manufactured by the Daimler Motor Company of Coventry, and are of the standard type, each being capable of developing 36 h.p. when running at the maximum speed. A separate petrol tank is supplied for each engine, with a combined capacity for 400 car miles. The normal speed is thirty miles per hour, but it has under trial attained a speed exceeding fifty miles per hour on several occasions. Another important feature of the vehicle is that the machinery frame and the superstructure are quite independent, so that if it is necessary to detach one from the other all that has to be done is to jack up the body and the machinery in its frame can be withdrawn easily from beneath. Furthermore, the machinery can be dropped from its chassis intact by releasing the bearings on the axles.

This petrol-driven coach is to be introduced upon the service between Hertford and the main line at Hatfield, a distance of nine miles. That both the railway authorities and the builders have great confidence in this class of vehicle for the exigencies of short branch-line traffic is testified by the fact that the construction of a larger and more powerful car upon the same lines is in progress. Such a car to be economical in all-round service must be capable if required to carry a certain quantity of luggage, and occasionally haul another waggon such as a horse box. By the interesting application of independent motors for propelling the vehicle the standard of reliability in driving is considerably enhanced, as in the event of one motor failing the vehicle is not rendered absolutely *hors de combat*, but can be run upon the remaining unit of power.



TROLLEY OF THE GREAT NORTHERN PETROL-DRIVEN COACH

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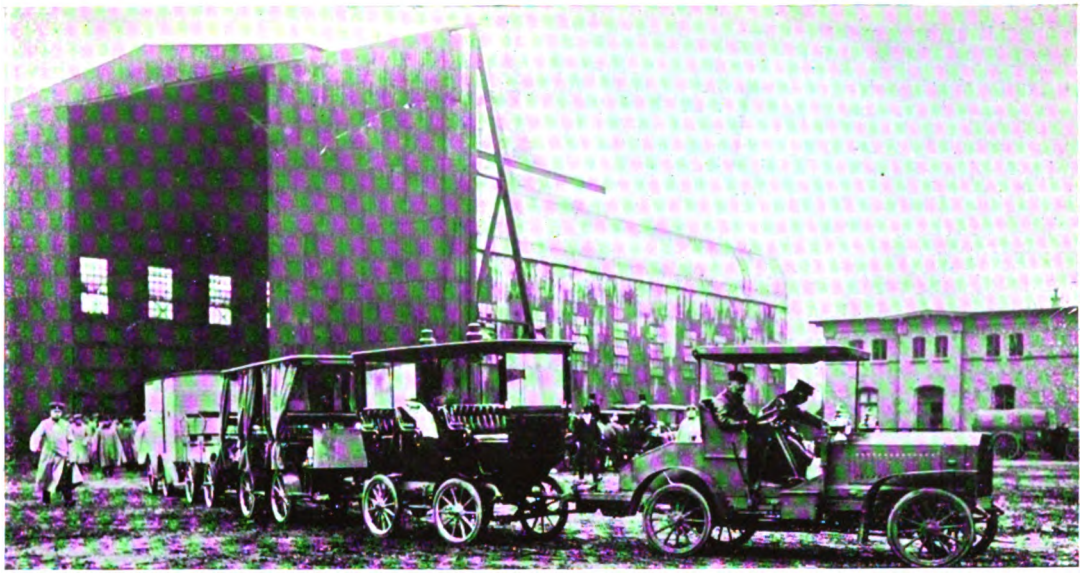
THE RENARD TRAIN WHICH TRAVELLED FROM PARIS TO BERLIN



THE MOTOR-TRAIN WITHOUT RAILS

AN INVENTOR'S SOLUTION OF SOME INTERESTING PROBLEMS—A TRAIN OF SELF-PROPELLED ROAD VEHICLES—WILL IT DISPLACE THE TRACTION ENGINE?—ITS POSSIBLE APPLICATION FOR THEATRICAL TOURING COMPANIES AND SHOWS, ALSO AS RAILWAY "FEEDER" WHERE TRAFFIC IS SLIGHT

INTEREST has once more been revived, by the journey of the Renard train from Paris to Berlin, in the possibilities of this type of locomotion for certain classes of work. In this country, as well as in others, the utilisation of a motor, either petrol or steam, for tractor work in the place of animals is being rapidly developed. A turn of the handle of the petrol motor and the pulsating engine is ready to go wherever and whenever the driver desires. So far, however, in haulage work only one or two additional trucks or waggons have been attached to a single tractor. This arises from the fact that the motor has to overcome the inertia of the vehicles behind and to supply the requisite energy for the whole train; also, the negotiation of curves, unless upon a wide road, becomes a serious difficulty, since the danger of side-skidding is ever present.

In the Renard train the inventor has surmounted these problems in an ingenious and interesting manner. Only one of any number of vehicles comprising the train is fitted with the motor, and this engine is of sufficient power to propel from eight to ten times its own weight. The power thus developed is transmitted throughout the whole train by a special device or coupling, the action of which is such that each vehicle, as it were, becomes a separate self-propelled vehicle, the whole obtaining their energy from the common source as supplied by the leading tractor.

This end is achieved by providing each carriage with a pair of driving-wheels, the power being transmitted thereto from the gear box of the engine through the special coupling which in one sense of the word constitutes a continuous shaft from the engine to the rearmost vehicle. The advantage of this arrangement is that there is no adhesion of the wheels of the various carriages to the road, and no huge amount of inertia for the train to overcome, since each unit propels itself with as much facility as if it were fitted and derived its power from a motor.

In this train are comprised several ingenious devices in addition to the continuous propelling shaft. Most important of these, in connection

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with the accurate steering of the whole train, is a special arrangement by means of which the trajectory described by the tractor is followed identically by each succeeding carriage, so that no matter whether the train is made up of two vehicles or twenty, accurate guiding is obtained with equal success in either instance. This desideratum is accomplished by a combination of three elements: first the wheel base; secondly, the length of the draft bar from the axle of one vehicle to the point at which it is connected to the preceding car; and thirdly, the distance from the front face of the draft bar joint to the axle of the preceding vehicle. By the correct combination of these three fundamental principles accurate and easy steering is assured. The driving coupling between each vehicle is flexible, consisting of a universal or Hook's joint, thereby enabling the train to accommodate itself easily and without any undue strain upon any part, to the most complicated tracks. This continuous shaft is so made that the couplings can be easily and quickly attached or detached as required. Each vehicle is fitted with gears meshing from the continuous shaft with a differential gear fitted to the rear wheels of each vehicle, which are thus of the true axle type.

In this particular train the tractor comprises an ordinary 50-h.p. Darracq car fitted with the orthodox change speed gear. The only deviation from the standard pattern is in connection with the propeller shaft from the gear box to the rear live axle to enable the shaft to be extended throughout the whole train. The car is fitted with the ordinary change speed gear, and another similar independent device called a "variator." The object of this latter contrivance is to reduce the speed of the train to a predetermined limit, and it is set to this required degree before the train starts. This variator, however, exercises no effect upon the conventional change speed gear beyond reducing the number of speeds it is capable of giving, according to the setting of the variator. The operation of this apparatus may be explained as follows. When it is set to the first position the speed of the train through the medium of the ordinary change-speed gear ranges from ten to forty-five miles per hour; by placing the variator in the second position the speeds are reduced by one-half, giving a radius from five to twenty-two miles; by setting it to the third position the speed is still further reduced by one-half, extending from two and a half to eleven miles per hour.

The speed of the train naturally varies according to the number of carriages of which it is composed, their description, and consequently the resultant weight. With the variator set to the third or slowest point, the tractor can haul approximately ten vehicles of its own weight upon an average road at a speed ranging from two and a half to eleven miles per hour. By limiting the number of vehicles to four or less the train can travel from five to twenty-two miles per hour. A train consisting of two stage coaches and a baggage waggon can attain a maximum speed of 21 miles per hour. A mixed train of. say, seven vehicles representing a weight of ten tons can reach a maximum speed of ten miles per hour. Detached from its train the tractor becomes an ordinary motor-car, and can travel at any speed possible with a car of its class and power.

There is one very important point which has been demonstrated by the trial trips carried out with this train, and which has not received the attention it deserves. That is the great tractive effort of a petrol motor-car. The possibility of an engine occupying only a few feet of space being able to haul a train of seven vehicles weighing in the aggregate nearly a dozen tons appears to be ridiculous, and until the judicious combination of certain fundamental principles by M. Renard was indubitably regarded as quite out of the question.

Will it ultimately displace the conventional traction-engine and its heavy trailing waggons? Every municipality and county council is only too painfully cognisant of the dire effects upon the roads exercised by the cumbrous wheels of these unwieldy locomotives and trains. With the Renard train, however, the trailing coaches can be of light construction, carried on ordinary wheels which do not cut up, or otherwise damage the roadway surface. Many other advantages inherent in such a train might be enumerated. The most important, however, are the flexibility of the whole train; its complete control; faster speed without any attendant danger; its remarkable braking arrangements as afforded by the continuous propeller shaft gearing directly with the driving-wheels of each carriage; its low cost of maintenance, serviceability, and instant use; and the reduction in the number of men requisite for the attention of the train while on a journey.

Its applications are many, supposing the system to be a success. Among travelling theatrical companies a heavy item of expense is in connection with railway fares for the members,

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properties, and scenery. On one of these trains the whole staff and baggage of even an elaborate production can be carried at a speed ranging from ten to fifteen miles per hour for a total cost of a few pence per mile.

THE AUTOMOBILE TRAIN INSPECTED BY GERMAN POLITICIANS

Upon railways, again, it has great possibilities. There are many districts where the population is too sparse and the agricultural or industrial traffic too slight to warrant the opening up of a new railway branch. The work of feeding the main lines in such districts could be completely carried out by such a motor train as this. The varied type of vehicles comprising a train enables passengers and goods to be carried simultaneously. As a means of collecting agricultural produce over an extensive area it is ideal. Another difficult railway problem it would also solve is in connection with the local traffic in rural districts where a railway line is already in operation, but owing to the high expense entailed in the construction of rolling-stock and its operation is at present maintained at a loss. This Renard train is claimed to be easily applicable to such requirements, and owing to low initial cost and maintenance charges could convert what is often at present a heavy loss into a substantial profit. Its further development will be watched with much interest. So far, it can hardly be said to be beyond the experimental stage. At present, too, the law in England stands in the way here, as it has often done in motor development.

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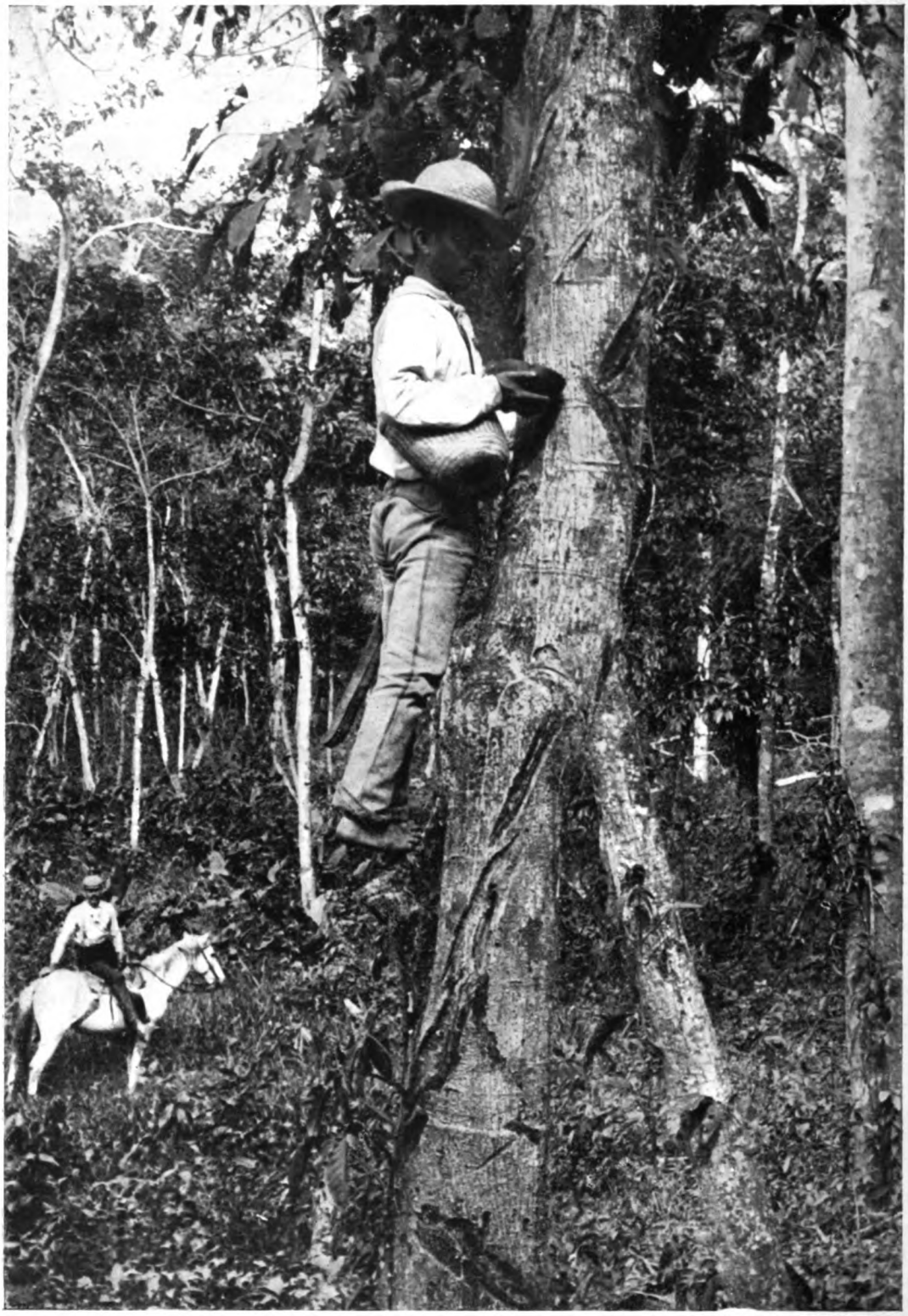

Underwood and Underwood

WHERE THE RUBBER COMES FROM FOR MOTOR-CAR TYRES

A NATIVE EXTRACTING RUBBER IN A SOUTH AMERICAN GROVE

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THE MAKING OF RUBBER TYRES

AN IMMENSE INDUSTRY IN WHICH ONE COMPANY ALONE PRODUCES FIVE THOUSAND TYRES A DAY—THE VARIOUS PROCESSES UNDERGONE BY THE RUBBER FROM THE TIME THE SAP IS COLLECTED IN SOUTH AMERICA TILL THE TYRES APPEAR ON THE MOTOR-CAR—DOUBTS ABOUT THE PNEUMATIC—IS THE SOLID TYRE THE BEST?

BY

F. A. A. TALBOT

NOTHING conduces so much to the comfort and smooth travelling in a motor-car as the tyres. Nothing is so much abused. Nothing causes so many delays. At the same time the tyres are the most expensive item in the maintenance of the vehicle. But in spite of these disadvantages, the tyres will still be of india-rubber until a more durable, hard-wearing, and equally resilient material, possessing all its virtues and none of its defects, is discovered.

India-rubber, or caoutchouc, is a dry, coagulated, milky juice, the sap of trees and shrubs indigenous to the most unhealthy and inaccessible regions in the equatorial countries of South America. Recently, it has also been found in large quantities in certain areas of West Africa and the Uganda Protectorate. Our markets are therefore dependent upon spasmodic supplies brought down to the coast by natives, and the difficulties both of obtaining the raw material and its transport to the nearest seaport are innumerable. The mortality among the natives in this quest for rubber is enormous and owing to the limited supplies that can be brought into market at one time the demand naturally exceeds the supply, with the result that the price is inflated. Moreover, these natives are in the hands of brokers, or, as they are facetiously termed, "grub-stakers," whose object is to restrict the output so that high prices may always prevail. Our manufacturers are entirely in the hands of these speculators for their requirements. The natives are equipped for their hunts by the brokers, and venture to the haunts of the caoutchouc-trees by boats and enforced marches through miles of thick forests. But the unhealthy climate carries off the rubber-hunters like flies, and the percentage of those who return from the expedition is very low. Again, owing to the difficulty of transporting the product from the forests to the markets, only small quantities can be brought down at one time, and the natives dearly earn the small pittance they receive as a reward for their labours.

The sap possesses the many properties of a vegetable emulsion, containing the caoutchouc in the form of myriads of minute globules, each of approximately $\frac{1}{12500}$th part of an inch in diameter. The process of tapping the trees for the sap is closely akin to the method of extracting syrup from the maple-trees in North America. The sap is collected in large vats. The juice is then submitted to a heat and smoke treatment. A fire of palm-nuts is made and a pole is inserted into the vat containing the viscid fluid. When withdrawn from the vessel, the end of the pole is besmeared with the sticky substance. The rubber is then held in the smoke issuing from the palm-nut fire until the sap coagulates. The treatment in the peculiar smoke effects the proper curing of the rubber. When the operation is completed, the pole with its charge is once more immersed in the vat of raw caoutchouc, and the smoke and heat process repeated, and so on several times, until there is a large knob or accumulation of rubber upon the end of the pole, constituted of hundreds of thin layers of rubber. The end of the pole is then cut out of the rubber and the spherical mass is duly examined by the broker and labelled according to its quality, either "Fine," "Medium," or "Coarse." Only the "fine" is used for the manufacture of motor tyres, the other qualities being devoted to various commercial rubber articles in which quality is not so essential. The finest india-rubber is that known as Para, and all others are judged from this standard.

The methods of extracting the sap, and its transit and curing, are so crude and primitive

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that upon arrival at the india-rubber factory in this country, the first stage in the manufacture is the removal of the foreign substances that may have become impregnated. This initial operation tends to increase the cost of the raw article from 5*s*. 6*d*. per pound to 7*s*. A large mass of crude rubber weighing perhaps a hundredweight contains several pounds of dirt and other foreign substances, all of which must be scrupulously removed and the rubber thoroughly cleansed. The masses of crude caoutchouc are primarily submitted to the prolonged action of hot water. The effect of this thorough soaking is to soften it, releasing the various impurities and, at the same time, serving to facilitate the subsequent manipulations of the material. When it has been reduced to a jelly-like consistency, the mass is cut into slices by means of sharp knives, and these slices are now subjected to the action of the washing-machine. This apparatus comprises two rollers, and the slices of rubber are passed between them for a number of times in much the same way as the maid passes the laundry through the wringing-machine. Hot or cold water is continually flowing upon these rollers, removing all the grit and dirt that may be present, while any solid masses that may be impregnated with the rubber become crushed under the action of the rollers and are carried away. Simultaneously the rubber itself is rolled out into thin sheets perforated by numerous holes, this porosity serving to expose the greatest possible surface to the action of the air. All water has now to be removed, as moisture has a deleterious effect upon rubber, and the porous sheets are hung up for some days in a warm room. Every vestige of moisture must be removed from the article, and this can only be done by slow drying; for if the operation were forced in any way the natural qualities of the rubber would be impaired.

What is vulcanisation? Few motorists have any idea. Perhaps they regard it as some method of joining one piece of rubber to another. As a matter of fact, vulcanisation is the process which destroys the natural extreme softness of the material, imparts body and fibre to it, hardens the article, and renders it less susceptible to melting except at a high temperature. Many motorists have doubtless experienced for themselves the heat which a tyre attains after running for some time upon the road. Were it not for the vulcanising process, such warmth, although not excessive, would at any rate considerably soften the substance and render it easily penetrable by sharp or pointed obstacles. If at any time a tyre has been observed to be somewhat soft in texture when warm, the cause may safely be attributed to improper vulcanisation.

This process consists of impregnating the rubber with sulphur, or some compound of that element, and thus destroying the soft nature of the material. After vulcanisation by a moderate heat a temperature of 100° C. scarcely affects it, neither does cold exercise any serious influence upon it; while, furthermore, the ordinary solvents fail to dissolve it. It is not simply a question of mixing the sulphur or its compound with the rubber that produces vulcanisation, but the actual combination of the two materials, and the resulting product therefore becomes really a new substance altogether. In this process, however, other ingredients, in addition to the sulphuric element, are often employed, these additional chemicals varying with the purposes for which the rubber is to be ultimately employed. In the department in which this phase of the work is carried out, exact proportions of sulphur and the other components are measured out, and the whole, or "batch," as it is called, is then sent to the mixing-mills.

It is at this stage that the heart of the tyre is made. The mixing-mills are huge machines comprising smooth-faced rolls, which are heated with steam or cooled with water as required. The rubber is submitted to prolonged rolling in this mill until it assumes a soft and tacky consistency. At this juncture the compounding ingredients are added, and the sticky mass subjected to further rolling at a temperature of about 140° C., until the whole mass has become thoroughly fused together. But the process of vulcanisation is not simply the application of an external coating of the sulphur and other compounds upon the rubber. The latter must thoroughly absorb the constituents. Consequently, this operation is one that requires consummate skill, so that the degree of impregnation or absorption may be correctly estimated.

The process of vulcanisation is not so simple as it may seem from this cursory description. The degree of manufacture has to be carried to a certain point and no further. Beyond that the texture of the material is once more completely changed, and should the operator by any chance proceed too far, then the rubber produced is not suitable for tyres. It becomes brittle and will crack. If continued to the extreme, the rubber becomes hard, horny, and

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blackish in colour, constituting what is commercially known as vulcanite. Vulcanisation completed, the process of manufacturing the tyre proper begins; and it is at this stage that divergence among the various manufacturers commences, more especially in connection with pneumatic tyres.

It was J. B. Dunlop who happily conceived the idea of inflating a hollow tube with air, and thus slinging the vehicle, as it were, upon an air-cushion. Notwithstanding the numerous so-called improvements that have been carried out in the design of pneumatic tyres, this article remains much in the same stage to-day as it was when Dunlop first initiated it. They nearly all depend upon the one primary point of enclosing the air (or inner) tube within a thick air-tight covering composed of rubber built upon a foundation of textile fabric. The only variation lies in the construction of the outer cover for the air-tube within, and its attachment to the rim of the wheel.

The inner tubes, in order to retain the air satisfactorily, are made seamless. And as strength is an all-important point, only the best Para rubber is used. The tubes are built on metal mandrels so that all seams and possible points of leakage are avoided. They are then wrapped in damp cloths and placed in the vulcanisers and cured in the open steam. Upon the exodus of the tube from the vulcaniser, the two ends of the tube are joined together by one overlapping the other, and secured by a special vulcanising operation. As the air-retentive quality of the tube is an important feature of the tyre, each tube is subjected to a thorough test in an inflated condition in a vat of water, to observe whether there is any air-leakage. This examination proving satisfactory, the tyre is consigned to the seasoning department for a long period so as to become thoroughly matured before being called into service.

The outer cover as a rule consists of a thick covering of india-rubber placed upon a substantial foundation composed of several layers of stout canvas. For the foundation, the best Sea Island cotton fabric is employed. In order to make sure that the material is very strong, pieces are cut from the rolls and subjected to a severe breaking-strain. The minimum pressure which it must resist is 250 lbs. per square inch (though this is by no means an exceptional pressure, since recently by means of a new system of manufacture a tyre can be produced capable of withstanding a bursting-pressure of 6000 lbs. per square inch). The fabric, before being used, is submitted to a drying process by passing between heated rollers so that every trace of moisture may be completely removed, otherwise not only will the life of the fabric be imperilled but the adhesion and impregnation of the separate strands with the india-rubber will be imperfectly accomplished.

The tyre is built up upon a steel core. A roll of fabric coinciding with the dimensions of the tyre is taken and passed through the "friction" calenders. By this operation the rubber is forced into the meshes of the textile material. This coating is then placed upon the core and superimposed with a layer or coating of pure rubber. Another similarly treated piece of rubber fabric is then imposed, followed by another layer of india-rubber, and so on, with alternate stratæ of fabric and rubber. The succeeding layers of fabric, however, are so arranged that each layer carries its full quota of the strain throughout the tyre. By employing the successive layers of rubber fabric and rubber, the tyre is converted into one homogeneous mass. Upon the last strata of fabric, which is to become the tread of the tyre, is imposed a final layer of rubber, varying in thickness according to the speciality of the manufacturer. This outer rubber-wall is simply confined to the tread-surface, as it has to withstand all the wear, while the sides or walls, having no such friction to resist, can be left comparatively thin. The edges of the fabric are collected and formed to constitute the bead of the tyre which fits into the rim.

Leaving the building department, the tyre is then carried to the mould-room. It still contains its circular steel-core, and is placed in a mould made in two halves. The mould with its contents is then subjected to extreme pressure in a hydraulic press. As the platens are heated with steam, the rubber is once more rendered soft, and under the influence of the many tons' pressure which is exerted both fabric and rubber are welded into a solid concrete mass. This is one of the most crucial stages of manufacture, requiring extreme care and skill on the part of the operator to ensure a uniform heat and pressure being maintained, together with the withdrawal of the tyre at the psychological moment.

As to the respective merits and demerits of the various tyres now upon the market, it is not the object of this article to offer any judgment. Each tyre possesses individual features rendering it valuable for certain classes of work. But it is obvious to the most uninitiated that the factors which determine the long life of a

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tyre are, first, its proper construction with the best and most serviceable materials, and secondly, the manner in which it is handled. Many a tyre is anathematised by a discontented motorist, when the source of the trouble and repeated annoyances, such as repairing punctures, are due not to the tyre but to the motorist himself. A high percentage of breakdowns are caused through covering the wheels of the vehicle with under-powered tyres. Consequently, not having been designed to resist such weight, speed, friction, and braking-power as that to which it is subjected, the tyre succumbs, much to the disgust of the motorist, who there and then vehemently declares that such and such a tyre is no good. Such a deficiency as this is often the result of ignorance, and in many cases the result of "saving expense," but the employment of under-powered tyres is in every sense of the word false economy. It is also obvious that a tyre, to be durable and reliable, should be provided with an ample thickness of rubber upon the tread. This is one of the important features of the Collier tyre—the wall of rubber, especially upon the tread, is of great thickness, thereby affording complete protection to the fabric-foundation.

The Collier tyre contains many special features. In the first place, it is not built up in the orthodox manner, while its method of attachment to the rim of the wheel is also widely different from the general practice. There is no beaded edge formed of the ends of the fabric, but in their place two wire hoops are, as it were, buried in the fabric, one on either side, which hold the tyre firmly and flatly upon the rim of the wheel. Now one of the greatest strains to which a tyre is subjected is rolling, combined with a tendency to fly off the wheel. This lateral strain is most severe when rounding corners at a high speed. In the usual method, by fully inflating the inner tube, the compression thus exercised tends to force the outer cover outwards, rendering the beaded edges taut in the grooved recesses of the rims, this pressure being maintained by means of clips. In the Collier, however, a circular flange is bolted right round the rim of the wheel on either side and secured by means of bolts placed at frequent intervals. This security, combined with the pressure action of the wire hoops in the fabric of the tyre upon the rim of the wheel, effects a rigidity and fixture not otherwise obtainable, and the strains of rolling are considerably diminished.

With this type of tyre also, an immunity from puncture is obtained. The fabric-foundation of the outer cover is of great thickness and strength, and the final covering of india-rubber being also of considerable thickness renders it impenetrable to a high degree. On the other hand, the Automobile Club tests showed this tyre to be less resilient—less elastic, less absorbent of shock—than other makes.

Recently, however, the attention of the harassed motorist who seeks for that freedom from tyre trouble which appears to him to be as remote as ever, has been attracted towards the new product of the Palmer Tyre Company. In this development an important departure from existing methods is made, since instead of building the tyre upon a foundation of canvas, a specially prepared cord is used, and by this means it is claimed that a more durable substance is available and the tensions exerted are better distributed. The cord used in this process is composed of a number of fine threads which are each separately treated by a patent process, so as to ensure the complete elimination of any air in the fabric. In the apparatus employed for this operation, the threads are passed through tubes into a high-pressure cylinder. The orifices of these tubes are just sufficiently large to admit of the passage of the threads. In the upper part of the cylinder is placed a thick india-rubber solution, while the piston in the cylinder is water injected under tremendous pressure, and the stress brought to bear upon the piston is conveyed to the rubber solution above. As the threads are forced into the aforementioned tubes the pressure exerted by the fluid-rubber forces back any air that may be present in the fabric, its place being taken by the rubber solution.

To show the tremendous pressure exerted upon the threads by this fluid-rubber, it may be explained that the stress of the piston in the cylinder is supplied from a hydraulic accumulator, capable of maintaining a continuous pressure up to as much as two tons per square inch.

The cords upon emerging from this apparatus are arranged equidistantly and embedded in a rubber solution. They are then subjected to a heat process which evaporates all the solvent from the rubber, thereby causing it to contract considerably and forcing the threads of the cords still closer and more tightly together. When withdrawn from the drying-chamber the cords are passed through a twisting-machine. Finally, a widely spaced spiral wrapping of fine thread is wound round the cord in the reverse direction of the twist,

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so as to prevent the former from untwisting, which it is liable to do owing to the elastic nature of the rubber. Another hydraulically operated apparatus comes into use to force the external wrapping upon the cords within and to apply an extra coating of rubber to the whole, upon the completion of which the cord is ready for use.

At this stage the cords are practically round in shape. They are now flattened somewhat, so as to lie evenly to the contour of the tyre. The cord is wound spirally backwards and forwards, terminating on either side in a loop, and is there anchored to a canvas bead by steel pins which are vulcanised into the fabric. Upon this foundation of cord is laid the conventional tread of rubber, though to prevent undue spreading of the latter when in contact with the road an endless belt of threads is embedded in the rubber layer to render it more stable.

In order to reduce the liability of puncture, however, some manufacturers are carrying out numerous experiments with a view to attaching a more substantial external covering to the rubber-tread, not in the form of a detachable protector but as part and parcel of the tyre itself. One of the latest of these types is the Lucas tyre, in which in addition to the fabric-foundation followed by the thick rubber-tread, is a final covering of chrome leather firmly secured by a special process, and sewn to the bead, which it completely covers. This prevents the outer protective covering becoming detached, and besides materially increasing the strength of what is naturally one of the weakest parts of the tyre increases its durability, since the leather offers a better unpuncturable medium to sharp obstacles on the road than the soft, pliable india-rubber tread. But the application of such external protective coverings is fraught with many difficulties, as by such action the very purposes for which the pneumatic tyre has been designed may be destroyed, and the air-cushion nature of the tyre completely nullified.

Many motorists have asked themselves why the outer cover, when substantially made, cannot be attached to the rim in such a manner that in itself it would become an air-tight tube, thus dispensing with the inner tube. Such a tube has long been desired. That it is not an impossibility was shown during the bicycle era by the Fleuss tubeless tyre. Now, however, such a tyre has been designed for motor-cars, and should it withstand the test of time it ought to command a wide vogue. In this instance the tyre is secured to the rim of the wheel by the agency of bolts. To secure air-tightness a flattened U-shaped channel is inserted upon the rim of the wheel, and the beaded edges of the tyre lie between these and the grooves of the rim. The latter is divided so as to facilitate the removal and installation of the tyre. The rim is secured by means of tapered bolts, which when screwed up give a tremendous grip upon the tyre and prevent it creeping, and which it is impossible to blow off. When the tyre is inflated the U-shaped channel upon the rim of the wheel closes the aperture between the two edges of the cover, thereby rendering it absolutely air-tight. The tyre is quickly and easily attached and detached, as it simply slides on and off the rim without the slightest exertion.

At the present moment, however, there is a revulsion of feeling among motorists concerning the pneumatic tyre being the most suitable and efficient means of clothing a wheel. Its disadvantages are so numerous and have become so patent that the question has arisen as to whether it has not been considerably overrated. The result of this indecision is that the solid tyre has made considerable headway among motorists, especially those who, having no desire to travel at a high speed, at the same time require to be free from troubles occasioned by the pneumatic tyre. During the past few months the Sirdar solid tyre, which has been so popular among the users of carriages and other horse-drawn vehicles, has been very widely adopted. Motor manufacturers, moreover, are gradually extending the practice of fitting the driving wheels of automobiles with this type of tyre. That this is a wise step there is no gainsaying, in view of the enormous and varying strains that the rear wheels have to withstand, and experience has only too painfully shown that it is the pneumatic tyres upon these wheels which are the greatest trouble.

As the result of experiments carried out by Mr. J. Lulich, of the Sirdar Rubber Company, it is claimed that up to a speed of thirty miles an hour, which is quite sufficient for the average motorist, a solid tyre will do all that the pneumatic tyre will do, and without the constant bugbear of sideslip. Moreover, it is a better hill-climber, since there is less loss of power.

But the manufacture of solid tyres for motor-cars, if they are to be serviceable and reliable, as well as durable, will need considerable revision if they are to hold their own against their pneumatic rivals. The prevalent system

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of attaching the tyre to the rim by a beaded rubber edge is open to many grave objections, the greatest of which is that when rolling strains are set up the edge of the groove exercises the same tendency as a knife, and cuts the rubber bead.

A new type of solid tyre, called the Reilloc, invented by Mr. A. T. Collier (its title being obviously his own name spelt backwards) who devised the pneumatic tyre of the same name, and containing many important principles, is being placed on the market. In the first place, the rubber-tread is built upon a fabric-foundation of substantial design. Secondly, the system of attaching it to the rim is a distinct improvement. There are two wires on either side. These wires do not come into actual contact with the rubber, but are accommodated in a channel formed of a spiral wire which thereby prevents the wire cutting the tyre. This wire at the junction of the ends is provided with a locking-barrel duly threaded. When, therefore, the tyre is inserted on the wheel, and the bead or edge forced into the grooved recess in the felloe, this locking-barrel can be screwed up, thereby pulling the tyre down tightly upon the surface of the rim. By the use of the side flanges bolted to the rim on either side any creeping motion is overcome, so that the tyre is held firmly upon its bed.

It will be observed that in this tyre nearly all the rubber is above the rim, having free movement in every direction, so that it has greater facilities to act as a cushion to the wheel. Greater resiliency (an all-important factor) is obtained than is generally the case with a solid tyre, and owing to the ingenious system of inserting the wires, there is no tendency for the rubber being cut by them, as the line of cleavage is not determined. For heavy vehicles this tyre promises very well, especially when used as a twin tyre for omnibuses. The twin type is capable of supporting a weight of two tons without exercising any deleterious effect upon the tyre or unduly compressing it. The incorporation of the fabric-foundation also renders the tyre more stable, and enables a softer rubber to be used, which is not otherwise possible.

Owing to the lapse of the patents governing the manufacture of pneumatic tyres in this country, the industry will now receive a great impetus. As it is, we easily hold our own as the largest tyre-manufacturing centre of the world. During last year the Dunlop Tyre Company alone manufactured no less than 1,556,220 tyres, which is an average of over 5000 tyres per day. From these figures some estimate of the importance of this industry and its extent in this country can be gathered. And the huge demand that has thus been set up has resulted in a correspondingly heavy increase of the raw material. Whereas in 1903 Para rubber could be purchased at 3*s.* 8¾*d.* per pound, it now stands at over 5*s.* per pound, and the supplies are growing scarcer every year. Therefore, it is apparent that unless some other serviceable substitute can be discovered, either by chemical and industrial investigation, or by a new natural product being brought to light, the rubber tyre will become a much more costly article than it is at present.

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THE ERA OF MOTOR FIRE-ENGINES

WHERE GREAT BRITAIN LEADS—ADVANTAGES OF THE MOTOR-PROPELLED ENGINE ON LAND AND WATER—HOW IT IS BEING ADOPTED IN OUR CITIES—PORTABLE INSTALLATIONS FOR COUNTRY MANSIONS—THE CHEMICAL ENGINE—A NOVEL FIRE FLOAT AND ITS ECONOMIES

GREAT BRITAIN is easily first among the nations in the application of mechanical power to fire-engines. Already several of our important cities possess motor fire-engines which are far in advance of any to be seen on the Continent. With characteristic enterprise, our manufacturers were not content to follow late in the footsteps of foreign practice, but led the way.

The essence of an efficient fire-fighting apparatus is the speed with which it can be conveyed from its station upon the receipt of a "call" to the scene of the conflagration. The finer this interval can be narrowed down, the more valuable the system. When it was realised that this desideratum could be satisfactorily achieved by means of the petrol engine it was boldly adopted. The pioneers in this direction have been the well-known firm of Messrs. Merryweather and Sons, Ltd., of London and Manchester. This firm, in view of the fact that the construction of fire appliances has been for many years their sole speciality, have designed and built many remarkable motor fire-engines, both for this country and abroad—their machines may be seen in operation at Selangor in the Straits Settlements, and Santiago in Chile. Nor has their enterprise been confined to the development of the machine for land work, for they have constructed some very ingenious and interesting fire-floats for service upon rivers, canals, and in harbours and docks as well.

The motor-propelled engine possesses innumerable advantages over the ordinary type of apparatus hauled by horses, notwithstanding the smartness with which the latter type of appliance can now be handled. Upon the receipt of a call no time is lost in harnessing the animals to the shafts; all that it is necessary to do is to start the motor up, and the engine can be leaving the station almost before the warning call is finished. Then again, when on the road it is much fleeter, a speed from twenty to thirty miles per hour being easily maintained, and hills can be easily surmounted, whereas in driving horses under such conditions the effort is bound to fatigue the animals.

Liverpool has rightly been called the most enterprising city in the world in the matter of fire-fighting machines. This seaport is equipped with a more powerful fire-extinguishing apparatus than any other city or town either in this country or elsewhere. It has the largest steam fire-engine ever designed, the "Holt," which has a pumping capacity of 2000 gallons of water per minute, while its other engines are of proportionately high power. Consequently when the motor-propelled appliance came into vogue, Liverpool resolved to maintain its reputation, and promptly acquired a motor fire-engine. This first vehicle was steam-propelled, while the pumps were driven by the same engine. There was an important deviation from existing practice, for the steam-boiler was fired by a liquid-fuel burner.

The superiority of this appliance over the horse-drawn vehicle soon became apparent. It could be turned out within sixty seconds of the call, was easily controlled, and could reach the fire in a less space of time. The maintenance expenses were small, it required fewer men to operate it, while it could travel at a speed varying from twenty to thirty miles an hour, and negotiate any hill in the district with comparative ease. It was submitted to a severe test at a huge fire, where it poured its 500 gallons of water per minute continuously for eight hours, without a hitch, ample steam being maintained without any difficulty throughout the whole time.

Owing to its successful issue from this severe test the Corporation immediately acquired another motor "fire king" of a similar type, which we illustrate. This engine differs from its prototype, however, inasmuch as it is fitted with a chemical cylinder for operation immediately the engine reaches the scene of the outbreak. The water-pumping capacity s identical with the first vehicle and the pro-

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pelling gear and pumps are also operated by steam power. The chemical cylinder contains sixty gallons, and 180 ft. of chemical hose is carried on a reel.

By the application of petrol motors for smaller fire-engines, both for propulsion and pumping, the weight of the vehicle is considerably decreased—which is an all-important consideration. Greater space is available for the accommodation of the firemen, and a far larger quantity of the various impedimenta employed in fire-extinguishing work can also be carried. As with the steam motor, the pumps can be set in action upon arrival at the fire immediately the hoses are in position. No time is lost in raising the requisite power for the operation of the pumps to their maximum capacity, such as happens with horse-drawn steam fire-engines, where valuable time is often lost in waiting till the steam pressure becomes adequate. All that has to be done with the former type of machine is the disconnection of the motor from the driving propelling gear, and its attachment to the pumps, which conversion can be carried out instantly by a simple operation.

One ot the most efficient, and at the same time most powerful, types of the Merryweather petrol motor fire-engines is that which was constructed for Baron H. de Rothschild. This vehicle is of the combined motor-propelled and pumping type, and contains several interesting features. The motor is of four cylinders, developing 30 horse-power when the engine is running at a moderate velocity, capable of driving the car at a speed varying from thirty to forty miles an hour upon the level. The two systems of ignition—magneto, and accumulator and coil—are provided so that in the event of one system failing an alternative is available; and the vehicle is provided with three speeds, the power being transmitted to the driving-wheels in the usual manner through a gear-box and chains to the rear axles. The engine is stoutly constructed, the chassis frame being of steel strongly stayed and mounted on wrought-iron axles, fitted with artillery pattern wheels shod with solid rubber tyres.

The extinguishing pump is capable of delivering 300 gallons per minute, and a single jet can be discharged to a height of 120 ft., while, if necessary, two, three, or four smaller streams can be projected simultaneously. The pumping arrangements are ingeniously controlled. The pump is driven off the fly-wheel of the motor and is operated through the change-speed mechanism which is utilised in the propulsion of the vehicle. Thus when the pumps are first brought into action the motor transmits the power to the pump through the low-speed gear, then passes through the second, and finally to the third when the maximum capacity of the pump is required. By this novel arrangement the height at which the jet is thrown can be changed as desired, and the system is especially useful where the water-supply is not very good or not sufficient to enable the pump to work at its maximum output.

Such a fire-engine as this is peculiarly suitable upon large estates and for the protection of country mansions. It can be turned out in five seconds and can be easily controlled by two or three men. It carries sufficient petrol and lubricating oil for about six hours' continuous work, and accommodates all the necessary adjuncts—such as hose, stand-pipes, &c.—and the suction hose always fixed and ready for instant action. Then its utility is not purely confined to the purposes for which it is expressly designed. Upon a large country estate it can be used for general irrigation work, such as pumping water-supply to the house, spraying trees, emptying ponds, and for many other purposes, thereby dispensing with elaborate and expensive installations to accomplish these separate operations.

For fire protection on small estates and in villages, a petrol fire-engine of much smaller dimensions and hauled by either manual or animal labour has been designed. In this type of vehicle the car is made especially light so that it can be drawn by men with complete ease. The motor is employed solely for driving the extinguishing pumps, and is either twin or four cylinders according to the calibre of the appliance. The pumps are of the high delivery type, discharging from 100 to 350 gallons per minute. They are cheap to run and invaluable upon farms, since in one of these engines the agriculturist has a constant and ever-ready source of power for a variety of work, such as driving churns, chaff-cutters, small electric lighting plants, or for hop or fruit washing, as the motor can be readily disengaged from the fire pump.

The number of country mansions which have been burned to the ground within the past few months is a striking proof of how such places are often completely gutted before the arrival of the nearest engine, which may be miles away. Mr. J. C. Merryweather of Whitehall Court, writing to the *Daily News*, remarks that people generally have hardly any idea how

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many pictures and other works of art are destroyed by fire every year. Practically within the last year, he says, the following cases have occurred: A Van Dyck and several other priceless pictures at Sir William Onslow's house in Cornwall; all the "old masters" at Westbury House, near Petersfield; a number of pictures and bronzes at Olantigh Towers, in Kent; several of Holbein's masterpieces, as well as paintings by Vandervelde, &c., at Knepp Castle, in Sussex; a Turner at Blunsden Abbey, in Wiltshire, &c. "I can quote," says Mr. Merryweather, "many cases of similar losses in years past, but those I have mentioned will show how serious is the danger of the destruction of our national works of art by fire, and how necessary it is for buildings in which they are kept to be periodically inspected by trained firemen, and for steps to be taken to provide means of readily extinguishing fires on their discovery." Many fires at country houses might have been subjugated with little damage had there been on the premises a petrol fire-engine, such as, for instance, the stationary installation at Holly Bush Hall—a typical example of how a country house can be adequately supplied with an inexpensive, efficient, and compact petrol engine and pump. The combination is mounted upon one bed-plate. The engine power is transmitted through a clutch, an admirable arrangement as it enables the pump to be disconnected to facilitate starting. The pump is of the high-speed treble-barrelled type, and a sufficient pressure is obtained to render supply available for any contingency. Nor need the appliance lie idle awaiting the conflagration which may never occur, for by a combination system it can be utilised for driving a dynamo for electric lighting at night and a pump by day.

Merryweather and Sons, Ltd.

THE LIVERPOOL MOTOR FIRE-ENGINE DISCHARGING A CHEMICAL JET

Another application on similar lines is that where the motor and pump are mounted on a

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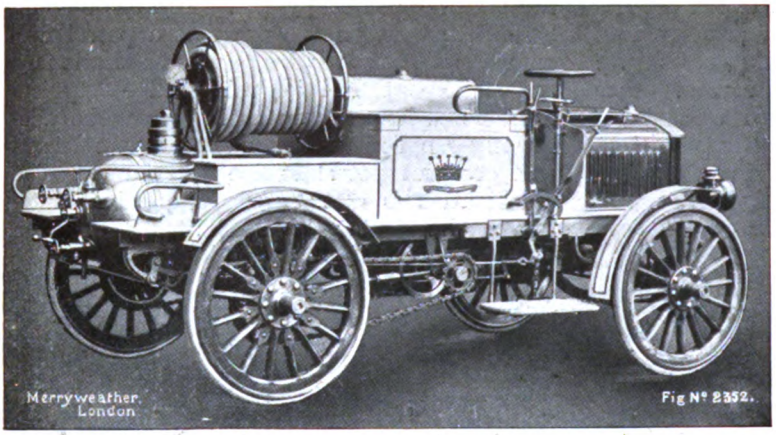

A MOTOR CHEMICAL FIRE-ENGINE SUPPLIED TO SYDNEY, N.S.W.

four-wheeled trolley. The motor develops from 6 to 8 horse-power, and the pump has a delivery of 100 gallons per minute through two powerful jets. This apparatus is especially applicable for farms, where there are necessarily a number of straggling outbuildings and hay-stacks. It can then be brought to the scene of operations in the minimum of time and worked all round the fire.

One of the most important acquisitions to a fire-engine station is the chemical apparatus for first-aid extinguishing work. A very interesting type of these appliances is that employed by the fire department of Sydney, New South Wales. The car is driven by a 16 horse-power petrol engine. The chemical engine consists of a cylinder of thirty-five gallons capacity, fitted with acid bottle, rotating mixer, safety valve, and exhaust pipe. The chemical jet is discharged from the cylinder into a reel fitted with 180 ft. of hose, and the chemical fluid can be discharged with any part of the hose still coiled upon the reel. The jet discharged is of great power, is heavily charged with carbonic acid gas, and lasts from ten to fifteen minutes. In addition, the vehicle has storage capacity for 600 ft. of ordinary fire hose, the necessary stand-pipes, and so forth.

For first-aid work these appliances are particularly adapted. No preliminary preparations are necessary, the vehicle being able to get away from the station within five seconds, travel at a high speed to the fire and immediately upon arrival throw a chemical jet of high pressure upon the flames. In 90 per cent. of the fires for which the brigade is called, the outbreak can be overcome by a chemical machine without recourse to the fire-engine itself. The motors with which these appliances are fitted are of great driving power as well as being speedy. Hills with gradients as steep as one in nine can be climbed at a high speed, and so perfect is the controlling and braking arrangements, that they can be stopped during descent, and made to reascend on the reverse gear with complete ease, thereby dispensing with the necessity of turning round.

Another interesting application of the chemical engine to the motor-propelled fire appliance may be seen in some of the outlying suburban fire stations, such as at Tottenham and Finchley. This vehicle is a combination of the chemical engine, tender, and fire-escape. For convenience, the chemical cylinder is accommodated under the driver's seat, with its attendant reel of hose placed well out of the way. The fire-escape itself reposes upon the top of the vehicle, with its wheels lifted clear of the ground, and the forward end projecting between the driver and his companion upon the same

A PORTABLE FIRE-ENGINE

Driven by 8-h.p. single-cylinder petrol motor. Capacity 100 gallons per minute through two jets. It can also be used for driving machinery or dynamo for electric light

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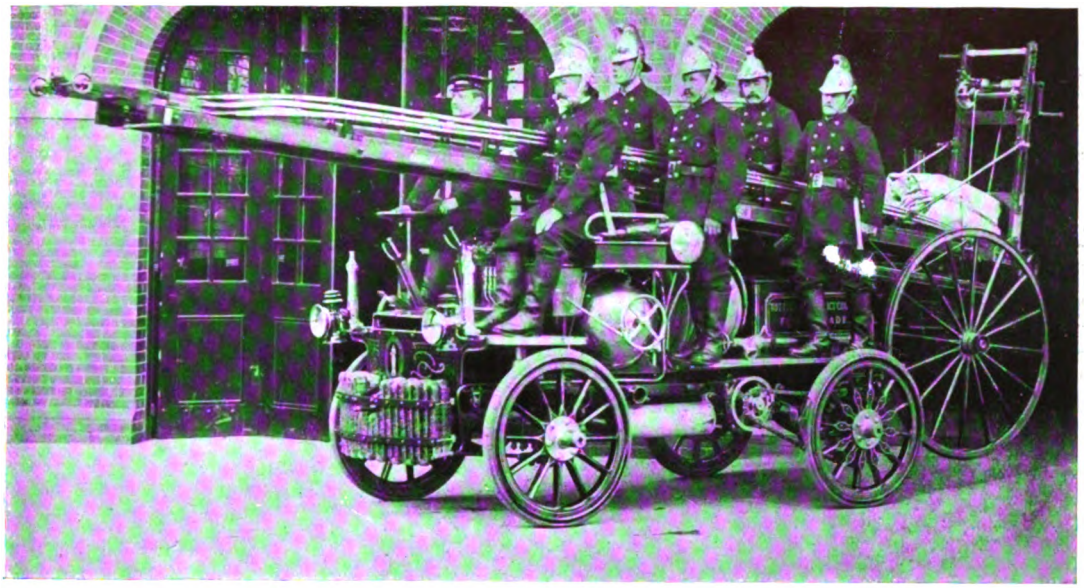

THE LATEST IN FIRE-ENGINES

A combination of the petrol motor, chemical engine, tender, and fire-escape as used in Tottenham and Finchley

Merryweather and Sons, Ltd.

THE LIVERPOOL MOTOR FIRE KING

Combined motor steam fire engine and chemical engine

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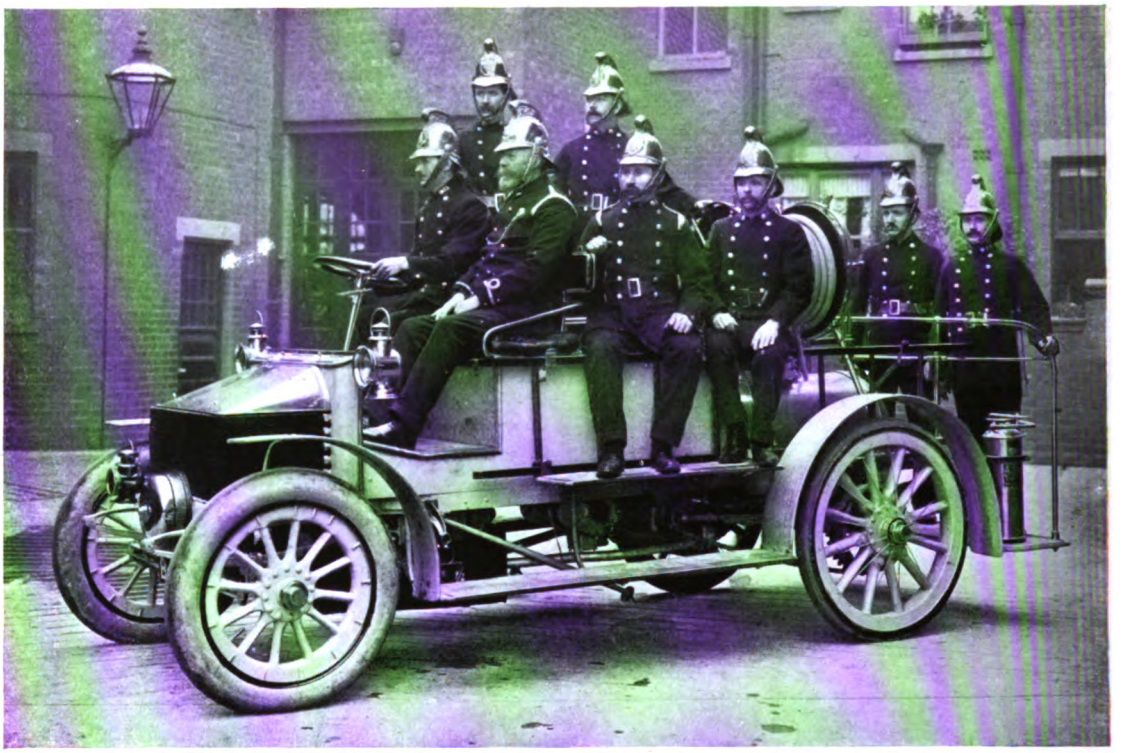
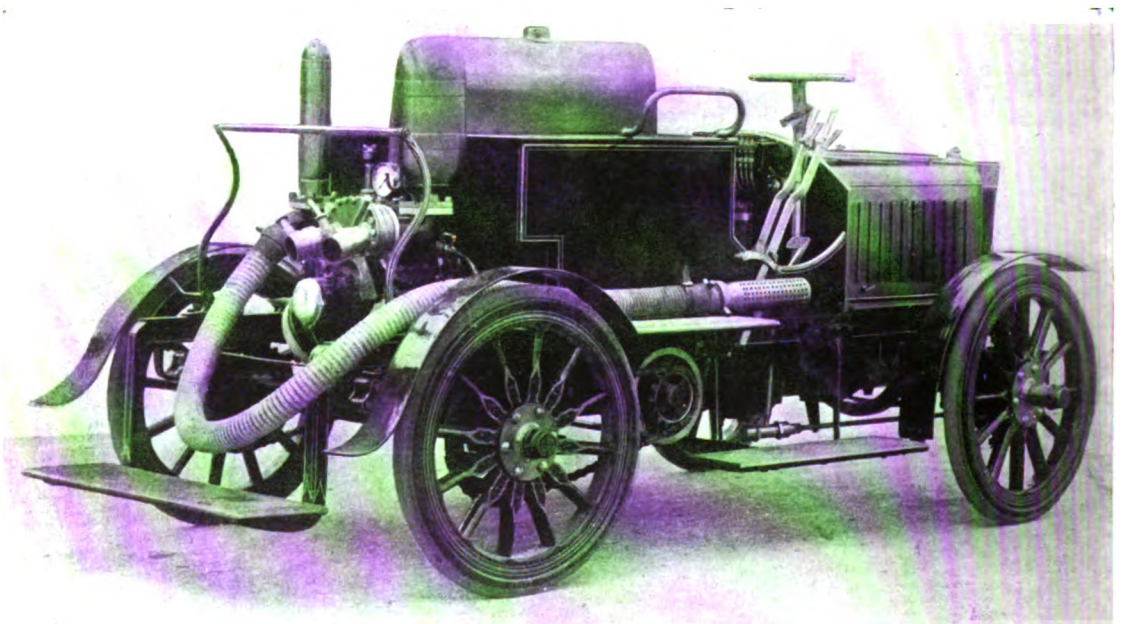


LEICESTER'S UP-TO-DATE FIRE-ENGINE

The 20-h.p. motor fire-engine as used by the Leicester Fire Brigade



BARON H. DE ROTHSCHILD'S FIRE-ENGINE, WHICH CAN TRAVEL ON THE ROAD AT THIRTY TO FORTY MILES AN HOUR

This is a 30-h.p. petrol engine, 4-cylinder. It drives the car and actuates the "Hatfield" treble-barrel pump through a positive clutch. The pumps have a capacity of 300 gallons per minute

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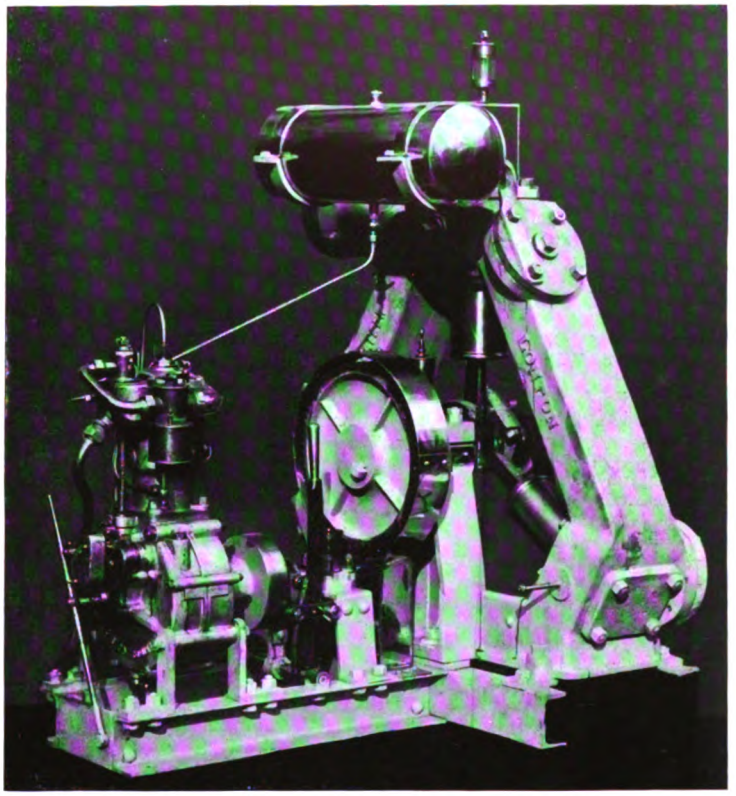
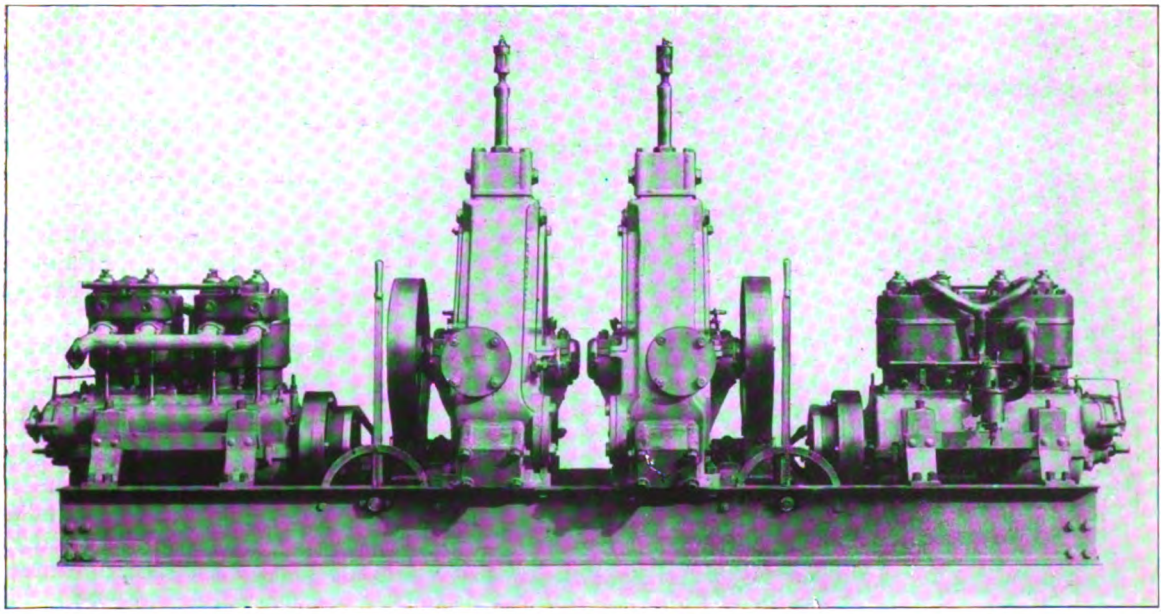
seat. This arrangement enables the whole apparatus to be very compact and neat, and yet any section is readily accessible. The tender is propelled by a 20 horse-power four-cylinder motor placed in the front. The ladder is of the telescopic type extending to 50 ft. Owing to the manner in which the latter is carried, upon arrival at the fire it can be detached and brought into use immediately. This type of vehicle has proved very convenient and handy, and owing to its combined nature is being widely adopted, mainly for the reason that what have hitherto constituted two units of a fire station—the ladder and the chemical engine—are here combined in one. Moreover, in the case of a fire it ensures the fire-escape being on the spot at the same time as the first-aid apparatus, which under former conditions, was not always possible.

Leicester has recently acquired a most up-to-date first-aid apparatus, built by the



PRECAUTION AGAINST FIRE AT COUNTRY HOUSES

The stationary single-cylinder petrol motor and Hatfield pump at Holly Bush Hall.



THE PETROL ENGINES ON THE FIRE-FLOAT

Two 4-cylinder engines, driving two Merryweather "Hatfield" treble-barrel high-speed pumps. Fitted on the hydraulically propelled fire-boat for Messrs. Huntley and Palmers, Reading. The combined capacity of the pumps is 600 gallons per minute

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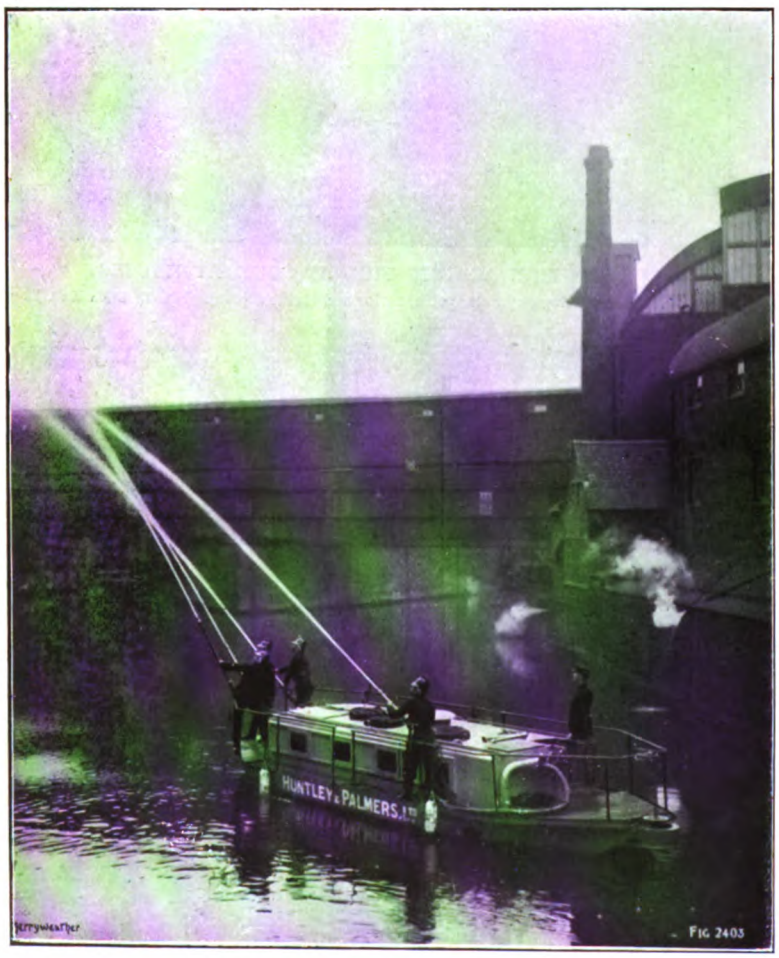
Wolseley Motor Car Company. It is one of this firm's standard types, with modifications to suit the special requirements of the Leicester Fire Brigade. The vehicle is of specially stout construction, the chassis being formed of a heavy channel steel frame reinforced with stiff transverse members, the whole strongly riveted together. The wheel-base of the car is 9 ft. 6 in., with a wheel-track of 4 ft. 9 in. The total length of space available for the accommodation of the appliances is 10 ft.—a considerable space, that can only be obtained (without extension of the wheel base) by using a horizontal motor. The engine and gearing are placed below the frame, which design not only enables a short bonnet to be used, thereby saving space, but at the same time places the centre of gravity very low, thereby reducing the liability of the vehicle to turn turtle.

The wheels also are of a peculiar design. In addition to the ordinary wooden spokes, reinforcing wire spokes are employed. This is an ingenious idea, as it not only strengthens the wheels considerably but renders them able to withstand the severe side strains constantly set up by collision with a curb or by taking corners at high speed. Many wheels of the artillery pattern are unable to withstand severe side strains.

This fire-engine is driven by a 24 horse-power Wolseley motor, the cylinders of which have a bore of $4\frac{1}{2}$ ins. and a stroke of 5 ins. The gear and other fittings are of the Wolseley standard pattern. Four speeds are fitted, developing 7, 11, 15, and 20 miles an hour respectively, with one reverse.



FOUR JETS ON THE RIVER KENNET

Merryweather's petrol fire-float, which gives protection from the river side to the great biscuit factory at Reading

In connection with fire-engine practice, special attention has to be devoted to the braking arrangements, owing to the fact that the vehicle has to be pulled up short and suddenly. The pressure must be the same on each side, so that there need be no apprehension of swerving when the car is pulled up short, while travelling at a high rate of speed.

The petrol capacity is 10 gallons, and the car although comparatively light in weight, being only approximately one ton, will safely carry 25 hundredweight of fire-brigade appliances. This vehicle is replete with one 50-gallon chemical cylinder, two extincteurs, two 9-ft. ladders, and one hose reel containing 160 ft. of hose, so that it will be realised that it constitutes a very efficient first-aid fire appliance.

That the motor-propelled fire-engine promises to become the fire extinguisher of the future there is no gainsaying, and it is safe to assert that in our large cities and towns the horse-drawn engine will become as obsolete as the solid-tyred bicycle. Petrol and steam motors have been brought to such a

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standard of perfection that reliability and steady working, even under the most adverse conditions, are assured. The facility and celerity with which they may be handled, their low cost of maintenance, ever readiness for instant service, and the speed with which they may be driven from the station to the fire, all serve to render their adoption desirable. In a comparative test with a horse-drawn engine over a distance of 1¾ miles, including a hill a quarter of a mile in length with a gradient of 1 in 8, the steam-motor was 3½ minutes faster than the horses.

For operations upon the water, also, the petrol motor is forging to the front, and is being widely adopted for small-power fire-floats. The same advantages, only to a greater degree than on land, characterise its application upon the water. Within the last few months many powerful marine fire-fighting vessels have been brought into service. The latest of these, and a type which will come very much into favour, especially for inland work upon calm water, is that which has been constructed for the protection of Messrs. Huntley and Palmers' biscuit factory at Reading, by the firm of Merryweather and Sons. Not only are the extinguishing pumps upon this float actuated by petrol motors, but the craft is propelled through the same agency by the discharge of hydraulic jets, which force the boat along either backwards or forwards, according to whether the jets are being discharged fore or aft, there being two such jets at either end of the boat. The works of this eminent biscuit firm, which cover thirty acres and have a water frontage of 600 ft., are bisected by a canal. It is upon this waterway that the fire-float is stationed ever ready for instant operation. Owing, however, to the canal being spanned by very low communicating bridges, leaving a space of only 4 ft. 6 ins. between the water level and the underside of the bridge, the boat had to be built low upon the water. In fact the limited headway available rendered the employment of a steam-propelled vessel quite out of the question.

The length of the boat is 32 ft by 9 ft. 6 beam, while it has a draught of 2 ft. 6 ins. The petrol motor installation comprises two sets of four-cylinder engines each developing 30 horse-power. These, together with the fire-extinguishing pumps, are mounted in line upon one bed plate at either end, with the two sets of pumps between. These can either be driven together or separately, according to the exigencies of the case.

On deck is fitted a monitor which can discharge a single powerful jet of water, and connections for half a dozen hoses which can be used simultaneously if required. The maximum pumping capacity is 600 gallons per minute at a pressure of 100 pounds per square inch. The suction supplies to the pumps are submerged and the water thus obtained is also employed for propelling purposes. The ingenious system of hydraulic propulsion adopted is eminently adapted to waterways of narrow width and renders the vessel much more convenient to handle than either screws or paddles. For instance by the simultaneous discharge of one jet at each end on opposite sides of the boat, the latter can be turned round upon its centre in much the same manner as if it were fixed upon a pivot. As a matter of fact, owing to the design of the vessel it must not necessarily be turned round, since it can be driven equally well from either end. The craft carries sufficient petrol supply for ten hours' continuous working.

The trials that have been carried out with this interesting float have demonstrated the vast possibilities of the application of the petrol motor for this class of work. The craft is simply moored in the canal. And while lying idle the boat is not costing money in the same way as a steam fire-float, where steam has to be maintained ready for emergency. There are no coal bills, no steam-pipes, or boilers to get out of order. The craft is ready for immediate use. One man of average intelligence can set the engines in motion, and control the operations of the vessel, thus dispensing with the need for skilled engineers and stokers. One other point in favour of the petrol motor is that after starting it develops its maximum power almost immediately, which is impossible with the steam craft. Another feature is that owing to the small space occupied by the motor and pumps, an installation can be fitted to a steam vessel without any elaborate alterations in the existing arrangement of the boat, while the installation can be placed on board a tug or other similar craft which was not primarily intended for fire-extinguishing work at all. Consider what this means, and the great saving in the initial expense thereby effected. For a few hundred pounds an ordinary boat can be fitted with a highly efficient and reliable fire-fighting plant, whereas if a steam vessel were specially constructed for the work the expenditure would run into thousands for the hull and the necessary elaborate machinery.

As yet the petrol motor fire extinguisher both on land and water is in its infancy. But its application is unlimited; its advantages are manifold.

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AN AMERICAN ROUGH-CAST OR STUD-AND-PLASTER HOUSE

Designed for a family of six with three servants Cost £700

BUILDING A COUNTRY HOUSE*

THE VERY LATEST FORMS OF CONSTRUCTION

LEGISLATION FORESHADOWED—BUNGALOWS OF CONCRETE AND STEEL—ONE-STOREY *v.* TWO-STOREY COTTAGES—LESSONS FROM NORWAY AND AMERICA—ARCHITECTS AND MANUFACTURERS—A MASS OF INFORMATION FROM PRACTICAL EXPERIENCE

BY

"HOME COUNTIES"

With plans and photographs specially prepared for THE WORLD'S WORK AND PLAY

IT is obvious that many desirable forms of cottage and bungalow building are impossible in by-laws-ridden districts. They can only be adopted where the building regulations of the rural authority do not include the provision for "brick, stone, or other hard incombustible material."

* See also the following fully illustrated articles by "Home Counties" in previous issues of THE WORLD'S WORK AND PLAY: "Cheap Country Cottages: an Authoritative Account of the Legal Difficulties and how they may be got over" (October); "Cheap Country Cottages: Practical Hints about Building them" (November); "Bungalows for People of Moderate Means" (December); and "How to Build a Cheap Bungalow" (January).

I. HOW THE BY-LAWS MATTER NOW STANDS

Happily, there is a lively hope that, with the opening of Parliament, the Cheap Cottages Exhibition and the bungalow-inhabiting season, the supporters of absurdly restrictive by-laws will be hard put to it to maintain them much longer in force.

Since my last article I have been charged by a high authority (in what I must admit were

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very kind terms) with doing injustice to the Local Government Board and the New Model by-laws. My answer was that I was under the impression that during the whole time that the building by-laws had been under discussion, no one had ever done fuller justice to Whitehall than I did in my article in THE WORLD'S WORK AND PLAY of October, but that if I had unwittingly fallen into any errors I should be greatly obliged by being afforded an opportunity of correcting them. I have heard no more, however.

[From the *Pall Mall Magazine*

THE WOODEN HOUSE OF THE SWEDISH PAINTER ZORN

It will be seen that it is of two storeys, and the photograph shows that it is considered safe enough for one of the King's sons, Prince Eugen, to stay at

I must, therefore, repeat, in the closing article of this cottage-building series, the opinion, arrived at after, perhaps, a closer study of the subject than any other journalist has been able to give to it—

(1) That the Local Government Board, while it has no power, as many of its critics imagine, to order the rural district councils to do this or that in the matter of building by-laws, undoubtedly exercises, as every rural resident of experience knows, a great influence over the local authorities;

(2) That, while the Board has repented itself of its Early Victorian notions of sanitary rural house-building (as expressed in the old Urban Model for rural districts), and has brought forth fruits meet for repentance

[From the *Pall Mall Magazine*

PRINCE EUGEN, THE KING OF SWEDEN'S YOUNGEST SON, IN THE PAINTER ZORN'S WOODEN HOUSE

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"THE SPINSTERAGE"

A wooden pleasure house on Seneca Lake, N.Y., U.S.A.

in the new Rural Model, its old attitude made it responsible for the adoption of many of the deplorably restrictive sets of building by-laws which were enacted some years back and are still in force in so many purely agricultural areas; and

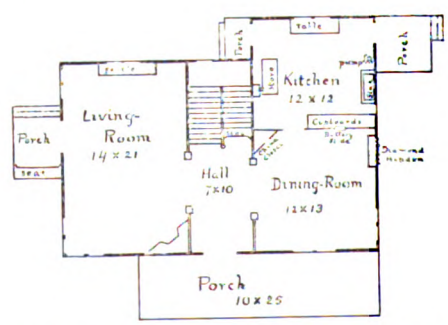
(3) That, this being the case, the Board would seem to have no good answer to my plea that it should issue a Circular to Rural Local Authorities, frankly owning that official experience and the progress of knowledge as to the true requirements of sanitary building now lead experts to believe that the regulations of the Rural Model are sufficient in purely rural districts, and that if Councils should see their way to amend the stringency of their existing regulations (based too rigidly on the Model for urban use) the Board would have pleasure in giving its sanction to their new rules.

I have great respect for Mr. Long, whose useful public work, no less than his rural experience at the Board of Agriculture and the Local Government Board, and as a considerate and enterprising landowner (I have heard, for instance, that in his private capacity he has been considering the claims of concrete), gives great weight to his views; but if plain citizens recognise that "it is human to err," and the Admiralty can "own up" over Rosyth, the War Office over Army Corps, and the Home Office over Adolf Beck, I fail to see what justification there is for the seeming disposition to claim infallibility for the Local Government Board. In the past the Board was the means of influencing rural building opinion in the wrong direction. It has now, by good fortune, the chance of influencing rural opinion in a more enlightened way. All I suggest is that it should seize the excellent opportunity which presents itself when, by the agitation of the Press and public-spirited landowners, the notice of the public has been directed to the not very interesting subject of building by-laws, and people are disposed to give it some attention.

Should, however, the Local Government Board deem it inexpedient to issue the Circular, no one believes that the reform of the by-laws will be prevented. Either by an Exemption Bill, introduced by a private member into Parliament, as suggested in my October article, or by constant worrying of the Board by the various devices known to legislators, power is going to be obtained to erect safe and sanitary dwellings in agricultural areas, without regard to structural requirements which may be necessary in the Strand but are out of place in a simple cottage a quarter of a mile from the nearest chimney-stack.

II. BUILDING WITH CONCRETE BLOCKS

In the meantime, however, there is the "brick, stone, or other hard incombustible material" restriction in existence. One way of conforming to it is to build in some form of concrete. I have already described a form of building in concrete blocks in my account of Mr. Wall's cottages made of this material. (For photographs *see* THE WORLD'S WORK



GROUND PLAN OF "THE SPINSTERAGE"

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A BACK VIEW OF "THE SPINSTERAGE"

AND PLAY, November). These blocks can be made on a barn floor by a farm labourer of anything from broken brick, stone chippings, quarry waste, river ballast or gravel, to coke and coke breeze, furnace cinders and clinker, burnt clay, brickyard or pottery refuse, and slag, so that it be clean and free from substances such as sulphur. But they call for nous on the part of whoever plans the building and specifies the sizes of the blocks, for there are windows, doors, &c., at which half- and quarter-blocks, &c., will be needed. There is also the difficulty of finding a local bricklayer with gumption enough to adapt himself to the requirements of the new material he is using instead of bricks, and a possibility of delays.

Concrete blocks can be bought as well as made. Here, for instance, are two letters we have received from readers who are willing to supply them. The first is from a working man:

"13 CROWN ROAD, EAST DEREHAM,
"NORFOLK, *Nov.* 9.

"*To the Editor of* THE WORLD'S WORK AND PLAY.

"DEAR MR. EDITOR,—I was very pleased to see your paper. I have been very busy for some time in making concrete blocks for building, and have also made a machine for making hollow blocks. These machines can be taken where we can get plenty of old rough sand or other rough stuff that will mix with cement, and get the cement and make the blocks on the spot where they are wanted to be used.

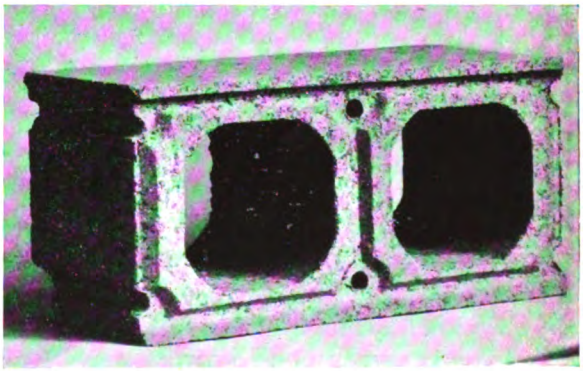
"These blocks can be made any size—3 in., 4½ in., 6 in., 9 in., 14 in., and 18 in., and they can be made any thickness and 18 in. long. The concrete is rammed into these machines and forced out with gear power, and when they come out of the machine they are quite square and they are channelled top and bottom and holes leading through to the channel. When they are stood in their places liquid concrete is poured down the holes and run all round the bottom channel and so make the bond.

"Any big boy can build with them, so you do not want the bricklayer, and the blocks are so smooth that they do not want the plasterer, either inside or outside.

"If any one wants to build cheap cottages, hollow concrete building blocks are what they want.

"I send you a model block, quarter size. This block was made three weeks ago from cinder ashes, and fine rubbish from dust heap, four parts and one part cement, and after making them I found there was some fine iron dust in it which turned the thing rusty.

"I have got the order to make two machines for South Africa, and an offer of £20 a month to go. I am getting out a machine so that I can make any size block. I want to make



MR. IMPSON'S HOLLOW CONCRETE BLOCK
Size, 4½ in. by 2½ in.

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A SPECIMEN OF CONCRETE BLOCK BUILDING BY A LIVERPOOL FIRM

something to let us working men have a decent house to live in at a lower rent.

"Yours truly,

"JOHN IMPSON."

Messrs. Pearson Brothers and Campbell of Liverpool, write as follows:

"18 WATER STREET, LIVERPOOL.

"*Nov.* 18, 1904.

"*To the Editor of* THE WORLD'S WORK AND PLAY.

"DEAR SIR,—We have been deeply interested in the article in your November number on Cheap Country Cottages, and as very large dealers in all classes of building materials have been

CONCRETE BLOCKS, SHOWING HOW WEIGHT IS REDUCED AND THE BUILDING OF CORNERS IS MANAGED

(Messrs. Pearson Brothers and Campbell, Liverpool)

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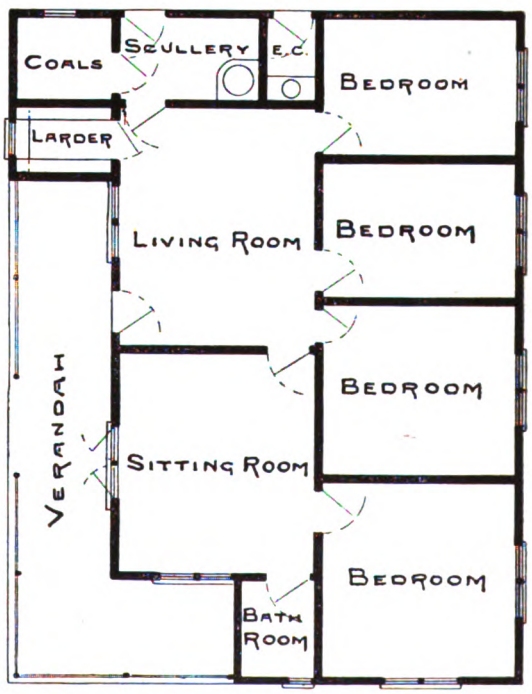
MR. DE COURCY BEAMISH'S CONCRETE SLAB HOUSE (CALWAY) IN PEMBROKESHIRE

The slabs are 2 in. thick. The creosoted wood framing holds the slabs in front with a capping; behind are battens. [Mr. Calway calls attention to the fact that the photograph shows a twist which does not appear in the building itself]

investigating carefully the problem of producing a cheap, artistic and durable material for the purpose. The result of our investigations has been that we are convinced that concrete will unquestionably be the material used in future, and our Mr. Campbell has only just returned from the U.S.A., where he gave this matter his closest attention.

"We have evolved a machine, worked entirely by hand power, and portable, to produce concrete blocks, and with the product of this first machine have erected a small building in the neighbourhood of this city, which has created quite an interest owing to its beautiful appearance. The walls are ten inches thick with cavities, and the plastering can be done on the inside direct on to the blocks themselves. Notwithstanding the fact that it was only erected to gain experience of actual cost, and is used as an office, and that it is covered with one of the most expensive and beautiful slates known, the price per contract works out at less than $4\frac{1}{2}d.$ per cube foot.

"On this little machine we can make bay-window, angles, blocks, straight blocks, quarter blocks, joist blocks, with any required design on the face, and when put together in the building they are so accurate that the dead-air space continues from the top to the bottom. Therefore the houses are warmer in winter and cooler in summer



PLAN OF A CALWAY CEMENT SLAB BUNGALOW

Price, with corrugated iron roof, foundations, brickwork, painting, &c., left ready for occupation, £250. With tiled roof, £300

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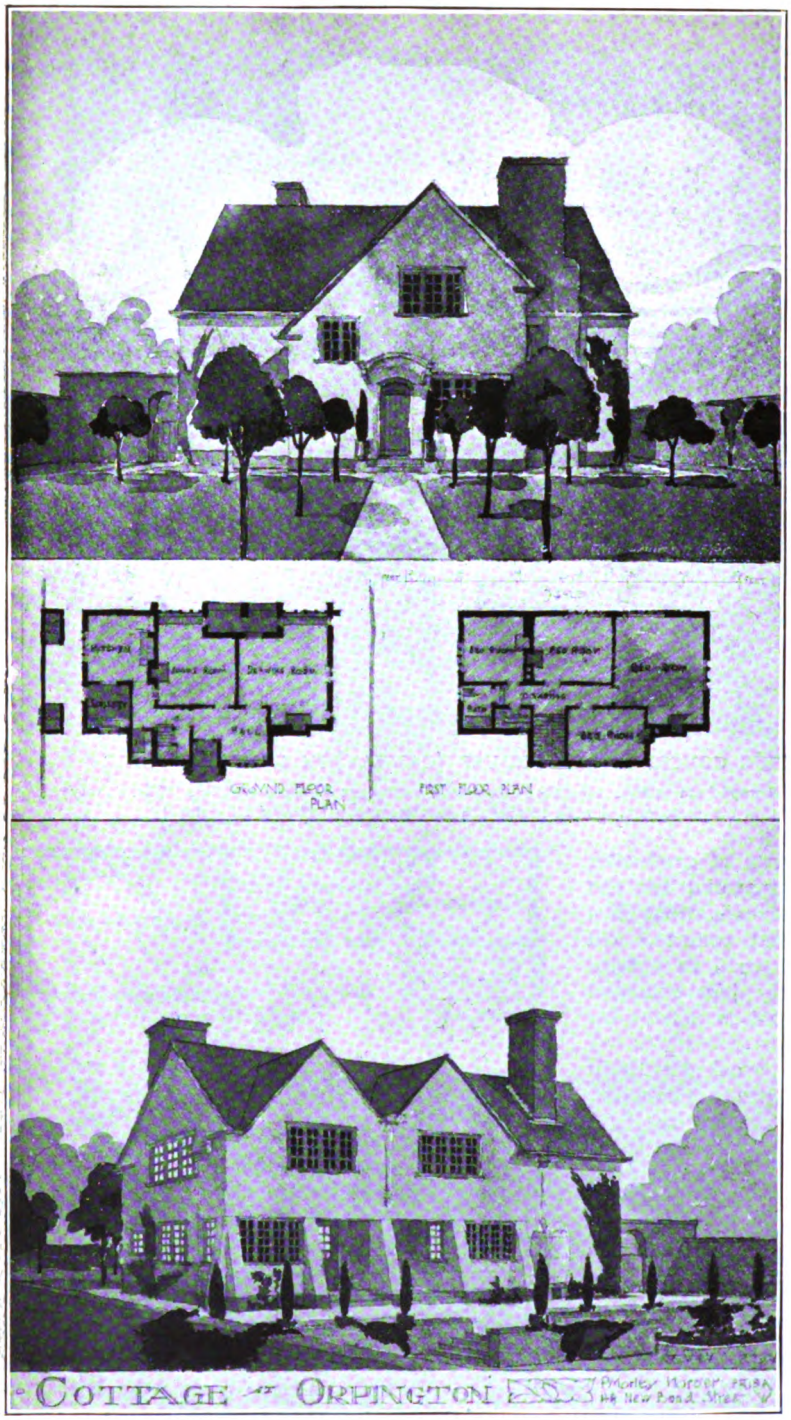

A COUNTRY HOUSE FOR £500 COMPLETE

and are more damp-proof. The proportions we use are four to one.

"Of course the advantage in the machine is that it can be moved to the site of erection in a wheelbarrow and only the sand and cement carted to the spot, rendering the builder independent from the delays of the manufacturer of bricks, materials, &c., and able to turn out his blocks just as suits himself.

"This particular machine turns out ten-inch blocks which fill the requirements of our District Council, but of course a smaller block of less width would be quite strong enough for a house with say three storeys.

"We take the liberty of sending you a couple of photographs, one showing the building finished and the other one the shape of some of the blocks produced by this one machine.

"Yours truly,

"PEARSON BROTHERS
"AND CAMPBELL."

An examination of the building papers will show that there are other people who also supply concrete blocks of one pattern or another. There is a Cavity Building Block firm at Deptford, and Messrs. Hodkin and Jones, of Sheffield, are the inventors of what they call an L-Building Block. The L-blocks are arranged on top of one another, as in the drawing. The result is that the wall seems built of bricks with bands of stone. The cavity makes the wall sound and damp-proof, and there is no necessity, in the case of a kitchen at any rate, for inside plastering.

Several of the firms who make these blocks assure me that they are an economical building material; but the expense of carriage is obviously heavy. Possibly, if breeze were more largely used in making the blocks, an equally satisfactory article might be produced at a lower weight. Breeze blocks have the advantage, too, of taking nails. Any reader inclined to consider

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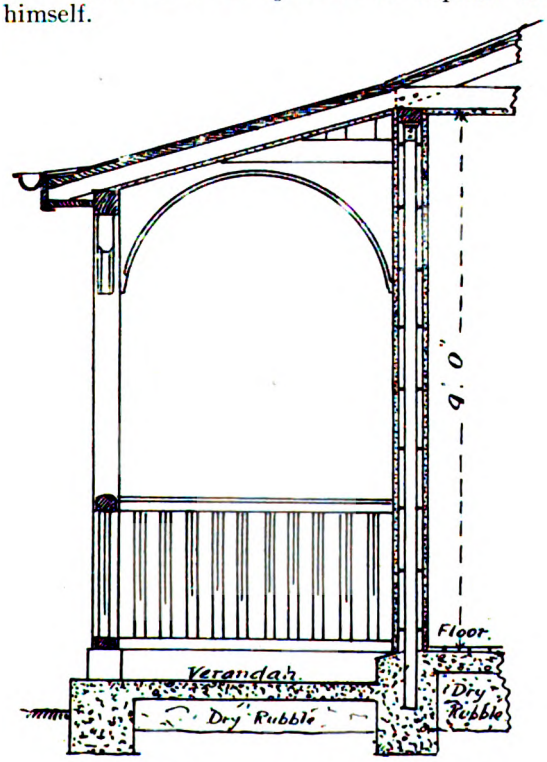
A VIEW OF MR. POTTER'S STEEL AND PLASTER BUNGALOW. COST, PROBABLY ABOUT £450

the possibilities of concrete block-building had better look into the question of expense for himself.

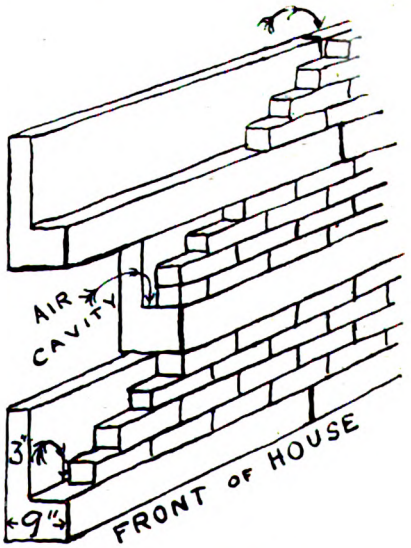


SECTION OF MR. POTTER'S VERANDAH

See plan on another page

III. MONOLITHIC BUNGALOWS

If it should seem illogical to pay carriage on building blocks, which, as Mr. Wall has shown, can be made on the premises, some students of concrete will no doubt be disposed to argue that it is waste of time, in other words money, to make blocks at all, when a house could just



THE L-CONCRETE BLOCK-BUILDING SYSTEM

The result, it will be seen, is a smooth surface inside and an air-cavity between bricks and blocks

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THE WICKLOW SUMMER RESIDENCE, NO. 28, AS ACTUALLY BUILT. COST £530

as well be built all of a piece in one great mass of concrete walling. In various parts of the country there are cottages—I have seen some of them—and many farm buildings which are really concrete monoliths. There is an illustration of the monolithic style of building in the right-hand edifice in the photograph showing three forms of concrete building which accompanied my November article.

The work is done by building up a kind of wooden troughing on the site of the walls of the house, and then filling it in with concrete. The troughing is removed, of course, as the walls rise. Those interested will find a full description of the process in the standard work on concrete, *Potter on "Concrete"* (Batsford, 7*s*.). Any one thinking of experimenting with concrete ought certainly to consult this book.

One of the difficulties with concrete is that, although a marvellously simple material, it requires, like all apparently simple work from hedging to road-making, painstaking attention. The hard stuff of which the concrete is composed must be clean, the cement must be fresh but not too fresh, and the combination of the two must be in exactly the specified proportion and mixed in the specified way and no other.

The popular notion that concrete building means a stiff and dreary house is all wrong. The most fashionable bungalow architects of the day are particularly fond of "rough-cast," and what difficulty is there in flinging shingle on the concrete and obtaining the much-desired "rough-cast" exterior?

To one advantage which concrete possesses for bungalow building I have never noticed any one draw attention. This is the fact that it makes a flat roof, and a strong flat roof, possible. If ever I build another house in the country for myself I am much inclined to try concrete, first, because I should save carting of bricks by getting my material on the spot; secondly, because the edifice would be warm in winter and cool in summer; thirdly, because I could have an Eastern roof for taking the air and the view and even for sleeping, for it would be the easiest thing to arrange iron stanchions to take a canvas sun- and dew-shade.

There is a considerable saving in material as well as convenience in having the flat roof. Of course, it has a slight fall, enough to carry off the rain-water through a pipe in the parapet; and it is covered with asphalte so that if there should one day be a slight crack in the concrete beneath there will be no danger from water.

The cracks with which concrete is so closely identified in so many people's minds are due to a variety of causes, which can be overcome by care. The most common are the absence of pieces of iron ("bonds") let into the material over doors and windows, the use of too "hot" cement or imperfectly cleaned hard stuff in the concrete, or imperfections in the foundation.

It should be mentioned that the addition of a little sulphate of iron to concrete makes it a pleasant tile-colour. As to the surface of the walls, if instead of "rough-cast" a mere trowelling over with cement and lime washing were held to be sufficient, would not *Ampelopsis veitchii* work wonders in two years?

IV. A GARDEN CITY EXPERIENCE

One of the forms of concrete building which has come into use of late years is that with which the names of Lascelles and Calway are associated. A correspondent who has had a bungalow built in the Garden City by Mr. Calway is good enough to write me as follows:

"I was interested in your notes on the Calway cement slab system of building because I am experimenting in this medium at the present time. I found I could get half an acre of ground

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on the Garden City estate, near Hitchin, Herts, for £3 10s. or £5 rent, according to the form of lease I chose — revisable or fixed term. This piece of ground is surrounded by fine elm-trees and tall hedges, is flanked on one side by an orchard, on another by a farm, and the southern aspect is over a field that will be turned some day into a pleasant cricket-field.

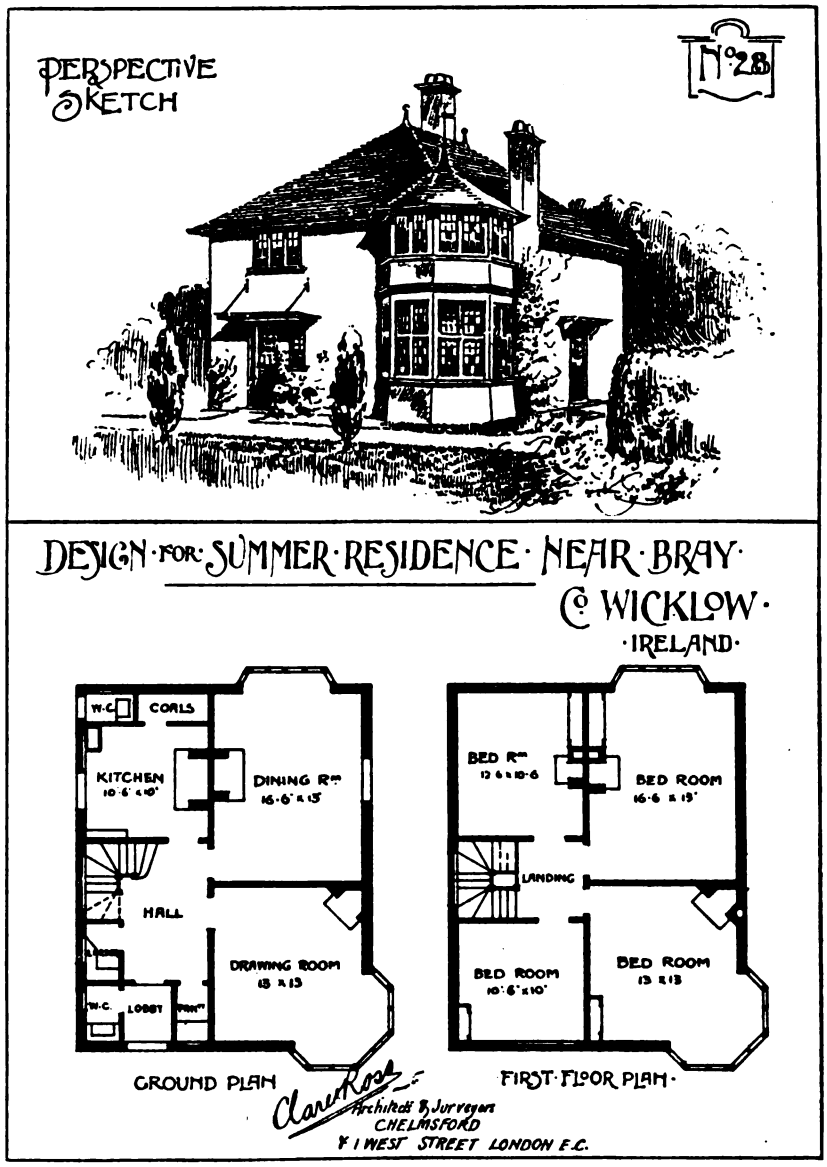
"But I did not want to spend more than £300. Now the £300 brick house did not appeal to me; above all I detested the horrid yellow brick. I saw a picture of a black and white cement slab building, and I journeyed down to Clayesmore School, Pangbourne, to see some class-rooms in course of erection. I found that the clean white slabs bound together by black bands looked extremely attractive against the green foliage. Train a few creepers up the walls, I thought, or some pretty ivy to take away the newness, and you have the effect of the old half-timbered house.

"I saw that the cement slab building looked far better than brick, and I found that it cost less, and that I could get a bungalow with sitting-room, large living-room, four bedrooms, bath-room and scullery and a six-foot deep verandah on two sides for £250, or, with best tiles on the roof to meet the requirements of the Garden City, £300.

"I am pleased to tell you that there is no obstructive conservatism on the Garden City building committee, and that they passed my plans.

"My building is now in course of erection, and, in my judgment, promises to be a cosy dwelling, and most pleasing, in a modest way, from an artistic point of view. I honestly believe that there is a great future before this kind of building. There is no fear of damp or rats and mice.

"I should say that the drainage will be an extra £10 or perhaps more.



"There are to be cesspit and W.C. outside the dwelling; no chimneys, but American stoves—the "Francesse" burning anthracite and keeping in for two days without stoking.

"I forgot to say that the total area of my house is 30 ft. by 30 ft. The bedrooms are: (1) 11 ft. 6 in. by 11 ft. 6 in.; (2) 11 ft. 6 in. by 9 ft. 6 in.; (3) 11 ft. 6 in. by 8 ft.; (4) 11 ft. 6 in. by 8 ft. You will easily deduce the rest.

"Let me thank you again for your articles and your help. Cheap cottages are quite a 'burning question' in London now, and your articles are much talked about and will be productive of much good."

With regard to my correspondent's notes, I

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venture to think a cesspit and W.C. a retrograde arrangement, and I am surprised, after the teachings of Dr. Poore and others as to the sanitary advantages and ease of working of E.C.s, that such a provision should be insisted upon by reformers like the Garden City people.

V. A BUNGALOW OF STEEL AND PLASTER

When I mentioned lately to Mr. Thomas Potter, the veteran author of the classic on concrete, that I was going to write yet another article of hints to the bungalow builder, he kindly offered to prepare a plan and give me a price for a structure of his own devising which he thought might be of service. The accompanying drawings from his pen largely explain his ideas. One is, it will be seen, to substitute for the wooden studs three-inch steel girders or stanchions, set up about five feet apart. On these girders are steel clips. Through these clips run long battens of steel. To these battens are laced on both sides sheets of expanded perforated steel. On this substitute for wooden laths goes rough-cast plaster outside and ordinary plaster inside, as in the case of an ordinary lath and plaster house.

The steel girders stand in a bed of concrete. Inside walls, that is, walls dividing rooms from one another, can be of brick. The roof is of tiles.

The advantages of this system are, safety (each stanchion is probably equal to sustaining the weight of four tons); great lightness (probably the walls of the cottage illustrated would be about thirty tons if they were built of brick; made in Mr. Potter's way, they are possibly not more than three tons, plaster and all); dryness (obtained by the cavity between the two sheets of plaster, and by there being no wet mortar to dry); safety from fire and vermin owing to absence of wood; durability owing to steel neither rotting like wood nor rusting. Mr. Potter's firm would fix the steel framework, but local labour would prepare the foundation and build the interior walls, chimneys and roof.

It will be observed that Mr. Potter suggests a one-storey design. This undoubtedly saves muscular wear and tear, and is convenient and comfortable in many ways. On the other hand, there is the extra cost of double the amount of roof. Against this one may set the substitution of cheap ground-floor space for more expensive second-storey floor space, and the saving on stairs and in height of chimneys. By cheap ground-floor space I mean that Mr. Potter would make his ground floor of concrete and cover it with good linoleum *while wet*. This sounds like a cold floor and a floor which would soon be in a deplorable state. Long experience, however, has attested its wonderful comfort and lasting-power.

Mr. Potter kindly favours me with the following interesting memorandum as to the details of the construction of his bungalow:

"The plan provides for drawing-room, dining-room, kitchen, scullery, and four bedrooms, with the usual offices. A small conservatory or greenhouse, and a verandah are useful adjuncts. As the internal walls are thin and only more or less sound proof, the kitchen department and servants' bedrooms are located at one end of the building, but between the kitchen and drawing-room a hollow double wall is shown to prevent sound passing through.

"The general construction—except so far as the external walls are concerned—is assumed to be of an ordinary character such as any village builder could carry out, but the external walls are formed with tee steel stanchions.

"These are embedded in a concrete base, which practically forms a portion of the foundation as well, and are fixed four to five feet apart. Steel lathing-bars about three-quarters of an inch wide, and a quarter of an inch thick, are fixed by means of very simple patent clips to the stanchions and to these, metallic lathing is fixed on both sides. The latter is put on to save damage thereto—after the roof is finished.

"With regard to strength, each of the stanchions will support a safe load of four tons, so that a very large margin of safety is provided.

"The construction is so simple that with the exception of fixing the lathing, it can be safely carried out by any intelligent carpenter.

"The cost is very little more than painted galvanised iron and wood construction.

"It is light (about one-twelfth the weight of a nine-inch brick wall), fire-proof and rot-proof (for no wood is necessary) quickly erected (in about as many days as brick walls would require weeks), perfectly damp-proof, and fit for occupation almost as soon as finished, and impervious to vermin.

"If this kind of construction had been employed for the Colney Hatch Asylum buildings, their destruction by fire would have been out of the question.

"The method shown in section, although simple, is the result of various trials and experiments to find something that might supersede brick and wood and galvanised iron, when occasion required.

"The floors in the plan shown are assumed to be of concrete on a dry rubble bed, and floor boards fixed thereto, or better still linoleum

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throughout fastened to a smooth coat of cement, and no floor boards, upon which carpet squares can be laid as required.

"Experience has proved that on sanitary grounds, this is the best of all systems of economical floor construction, while the cost of cleaning is incomparably less than wood floors.

"In addition a cottage or bungalow is practically vermin-proof and insect-proof, except through open doors and windows, and no mean advantage, especially when not occupied continuously.

"The cost would as a rule be somewhat less than two-storey construction, but would depend a good deal on locality."

VI. OTHER EXPERIMENTERS

In looking through a little book by Messrs. Clare and Ross, of Chelmsford, on cheap cottage and bungalow building by various concrete and concrete and steel methods, I see they estimate the cost of burning clay for concrete, as has to be done on sites where there is no gravel, at 2*s.* per ton. They maintain that their patent concrete walls are 33 per cent. cheaper than brick or stone walling. The accompanying illustration, reproduced from the book, gives some notion of the prices at which bungalows on their plan work out.

I am tempted to quote from this book the following passage dealing with a fact of which I have found would-be cottage builders to be curiously ignorant:

"Given a superficial area the square block covering this will cost considerably less to build than an oblong block Thus a block 20 ft. square or 400 ft. super. by 10 ft. high gives an area of walling equal to 800 ft. super., but a block 40 ft. by 10 ft., or 400 ft. super. and 10 ft. high, gives an area of walling equal to 1000 ft. super. or 200 ft. more than the square block. Therefore it follows that the nearer on plan to the square the house or cottage can be kept the more economical it will be."

And, of course, a rectangular block will always be cheaper than one broken up with a variety of projections.

Like other bungalow builders, this firm believes in the double Roman interlocking pattern tiles of Major's of Bridgwater:

"which cost less than the cheapest slates, are very durable, weather-tight, and suitable to an ordinary slate pitch of 30 degrees. [An ordinary tile pitch is 40 degrees.] They are at the same time neat in appearance, quickly laid and light, therefore not requiring heavy roof timbers; and of very large size, therefore not requiring so many battens on any given area and require no nailing or bedding. When slates are used we prefer Westmoreland green slates with plain slate ridges and hips. The colour of these combines well with red brick or rough-cast. The disadvantage of any kind of slate is that it is a good conductor of heat, and, therefore, rooms in a slated roof are hot in summer and cold in winter to a greater degree than those in a tile roof."

Messrs. Clare and Ross also dwell on the subject of staircases, in the absence of which the bungalow rejoices:

"For economical reasons there must be no waste spaces, and as the difficulty in avoiding this always occurs in connection with the hall, stairs and passages, it will be evident that the position of the staircase in a house is of the first importance. In many a house the waste passages, landings, &c., put together would make an additional room, and thus serve a useful purpose, instead of being 'cool chambers,' making the rooms draughty, generally lowering the temperature of the house, causing great discomfort to the inhabitants, and considerably increasing the amount of coal consumed in an effort (how often unavailing) to warm the house."

On the subject of the hall, on which the character of a house in the country seems to depend so much, the book before me makes the excellent suggestion that "if one of the fireplaces be arranged to back on to the hall, and be fitted with a Shorland patent stove in which warm fresh air is conveyed from the back of the grate to the hall, the warming of the rooms is greatly facilitated, and the consumption of coal in the house generally is reduced."

Mention of stoves reminds me that in building a bungalow nowadays the claims of the various forms of "well" and closed anthracite stoves, which burn from twenty-four to forty-eight hours without attention, should be considered before grates are ordered. Service is often so difficult a matter in the country that any means by which unnecessary dusting can be avoided—and the open grate is one of the greatest dirt-bringing agencies in the modern house—deserves the most careful attention.

VII. ONE-STOREY *v.* TWO-STOREY COTTAGES

I have spoken of the advantages of the bungalow form of structure. Here is a letter from Mr. F. G. Barnes, architect at Chatsworth, which sets out the case for the two-storey building. I reproduce a rough tracing of the pencil plan this correspondent was good enough to enclose:

"CHATSWORTH, DERBYSHIRE.
"*Nov.* 17, 1904.

"*To the Editor of* THE WORLD'S WORK AND PLAY.

"DEAR SIR,—It has been a great pleasure to me to read in your November issue of THE WORLD'S

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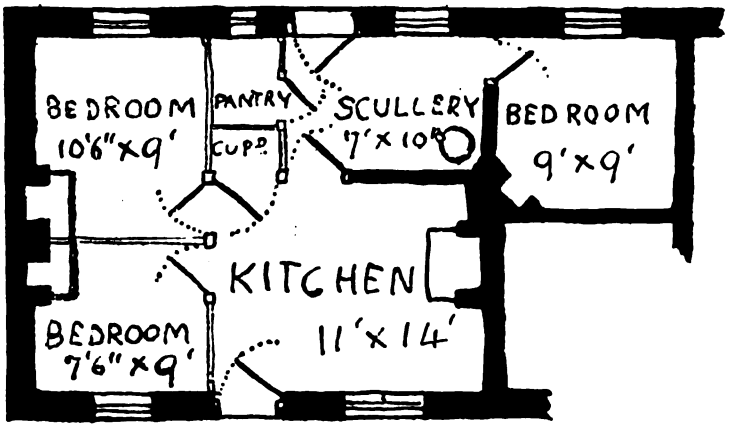


HOW ECONOMY MAY BE EFFECTED BY TURNING A SINGLE-STOREY BUILDING INTO ONE OF TWO STOREYS. I. LORD SALISBURY'S ONE-STOREY DESIGN

WORK AND PLAY 'Home Counties'' practical hints on the building of country cottages. Being myself an estate surveyor, I have had the opportunity of building cottages of various designs and various prices, and should like to make a few remarks as a supplement to the article in question.

"In your November issue several cottage plans are shown, but what appears to me so conflicting is the varied sizes of the different rooms, comparing one plan with another.

"For instance, one shows a kitchen 12 ft. by 12 ft., another 12 ft. by 8 ft., and another 14 ft. × 11 ft.; they probably are all the same height from floor to ceiling; but why such a variation in the sizes of the kitchens, &c.?

"My contention is that all cottages should have a minimum standard size for each room.

"It therefore appears to me almost useless to compare the costs of cottages, unless one adheres to the aforesaid.

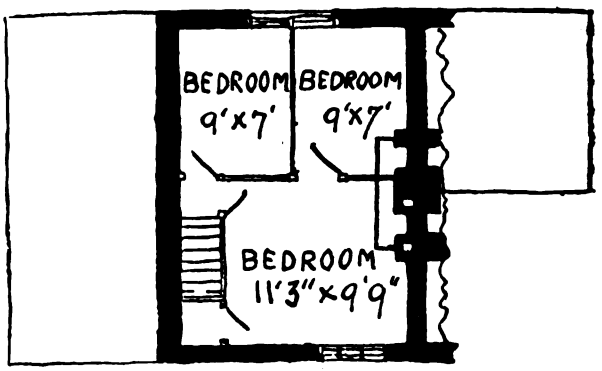
"Variation in the prices of labour and materials will always exist.

"The remarks by Mr. Rider Haggard, as to the cheapness of the one-storey cottages built for the late Lord Salisbury, are right in one sense and wrong in another.

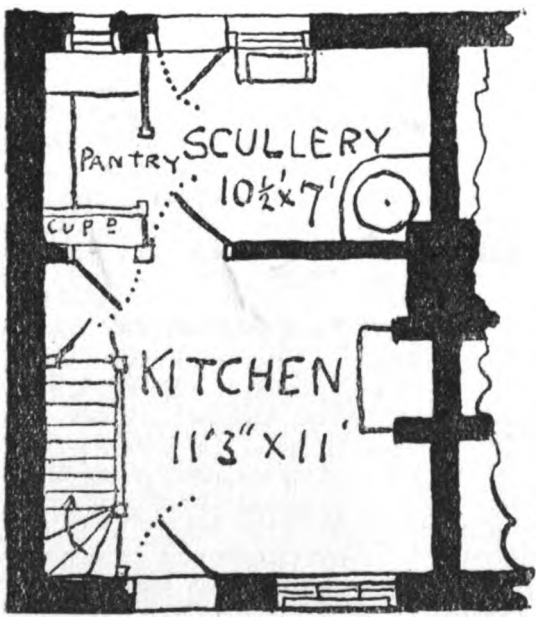
"The cheapness is right if you consider the accommodation as a one-storey cottage. Why build one-storey cottages? Had the bedrooms been placed over as shown in the accompanying drawing, I am sure a great saving in the cost would have been made. In appearance they would have been better, almost twice as many could have been built on the same space, and it would certainly do away with that objectionable and indecent part—bedrooms and living rooms adjoining, especially when they are only parted with match boarding.

"The number of cubic feet in the above one-storey cottages is about 8600, and in the two-storey 7000, so that it is possible to increase the sizes of the rooms by extending the cottages two more feet and still get a two-storey cottage cheaper than the one-storey cottages in question.

"Yours truly,
"F. G. BARNES."



III. MR. BARNES' TWO-STOREY DESIGN: BEDROOM FLOOR



II. MR. BARNES' TWO-STOREY DESIGN: GROUND FLOOR

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In going over the bungalow belonging to Mr. D. Allport, illustrated two months since, I was much struck by the amount of room he had got in his roof.

VIII. A PLAN FOR A BACHELOR

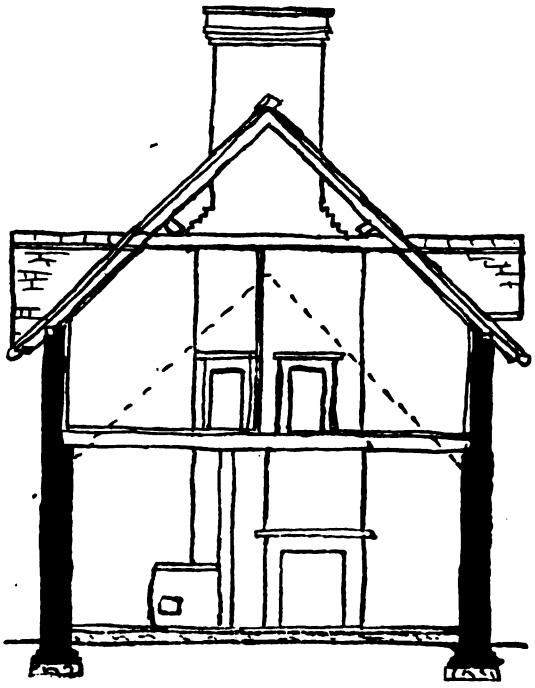
Another letter to hand is from Mr. G. Buller Colthurst, of the Avenue, Bedford Park, W., concerning a plan of his for a house in what in this article must be called, I suppose, normal materials:

"Having read your most interesting article in relation to week-end cottages, I thought the accompanying design for a client in Surrey may interest your readers, as it seems to embody several of the points you correctly deem essential in this class of work: Planning kept as square as possible; combined hall and dining-room, which could be divided in an effectual way by heavy curtains; scullery recess off kitchen with pantry convenient for placing china immediately washed; and small smoking den, or could be utilised for bedroom.

"The motor-shed is for motor-bike, but could be enlarged. It is built of nine-inch brickwork for safety and warmth. The outside lounge will form, when covered with creepers, a pretty sight, and is at the same time large enough to move about in with freedom in wet weather. Cottage finished in white rough-cast; with nine-inch border of tar to prevent damp rising up walls; woodwork on exterior dark quaker green; nine-inch green barge-board; pots dead black; roof covered with plain Colport tiles.

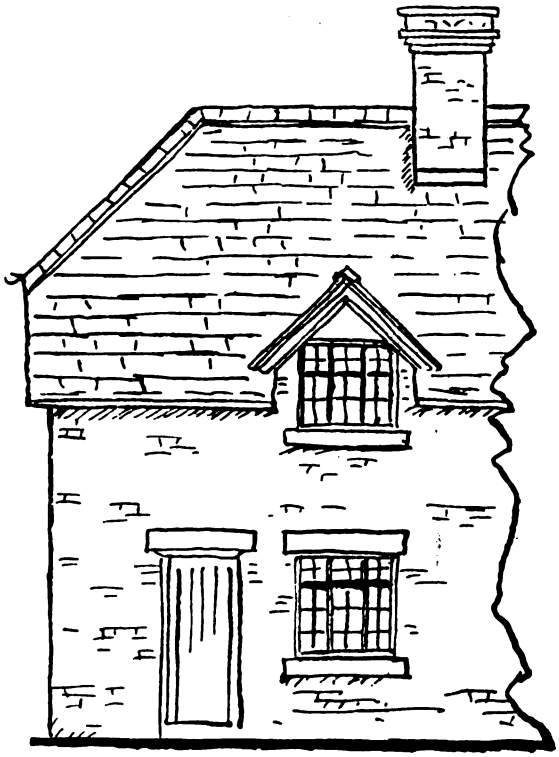
"This design could have another bedroom placed in the front if desired, but I am simply meeting the requirements of my clients.

"The cost of the design is to be £400 or thereabouts, according to a few details not quite decided upon, all work at that figure being of the best."



IV. MR. BARNES' TWO-STOREY DESIGN: SECTION

[Dotted line shows height of roof in Lord Salisbury's design]



V. MR. BARNES' TWO-STOREY DESIGN: ELEVATION

While Mr. Colthurst's design is striking enough, I should not advise any reader to build a place with such limited accommodation. Even if it suited a bachelor's purpose, he has to think of the difficulty in selling a place on so small a scale, should he get tired of it. The plan is interesting, however, as showing what is offered in an ordinary way for "£400 or thereabouts." I notice, by the way, that no earth-closet is provided.

IX. A NORWEGIAN DESIGN

Mr. F. Rushton Ablett, who has been impressed by the way in which the depopulation

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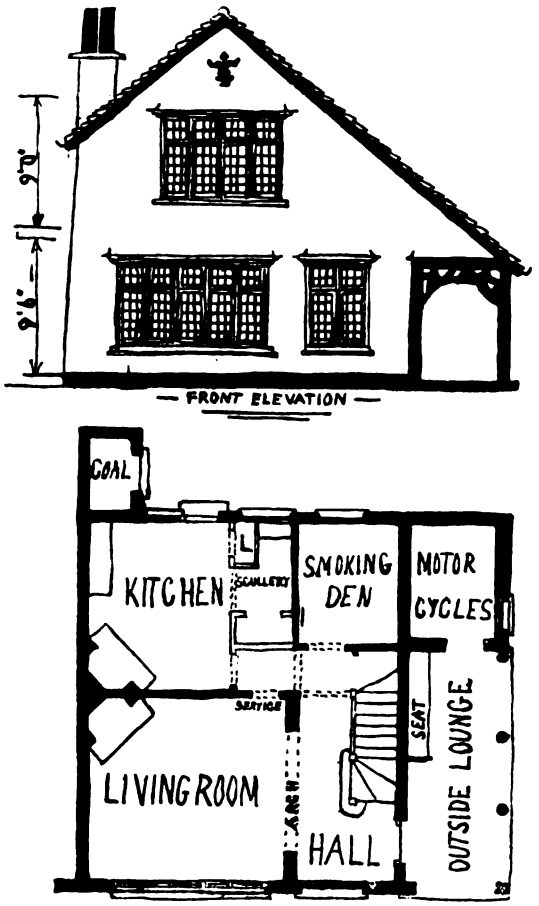

A PLAN FOR A BACHELOR

[Elevation and plan of Mr. G. Buller Colthurst's bungalow

of the rural districts is largely due to inadequate housing, writes as follows:

"HILL CREST, COOMBE HILL,
"EAST GRINSTEAD.

"*To the Editor of* THE WORLD'S WORK AND PLAY.

"DEAR SIR,—Some few months ago the idea occurred to me to design a cheap cottage on the Norwegian plan, and obtain an estimate for one ready to put together in England, and having given my ideas to a Norwegian firm of timber merchants, they have sent me an estimate for the cottage shown on the accompanying drawing.

"I can improve on the plan by increasing the size of scullery. This could be done by making the entrance to the living-room. A further improvement would be the addition of a coal-house and earth-closet, which would add very little to the cost.

"The price of this house in Norway is £92. Freight to London £8, making a total of £100.

"My object has been to get a cottage produced for £150, and I consider that £50 would be an ample sum from which to supply the extras—such as foundations, chimney and stove, glass, nails, screws, painting, gutters, tiles, and water accommodation. I think fencing, &c., could also be included.

"This style of cottage is wonderfully durable, and may be seen standing in Norway. Some of these cottages have been erected over two hundred years.

"My attention was called a few days ago to an interesting article by 'Home Counties' in THE WORLD'S WORK AND PLAY for January—and having read this I also procured the back numbers from October, and have found the subject most interesting.

"I am, dear Sir, yours faithfully,
"F. RUSHTON ABLETT."

The specification for Mr. Ablett's cottage containing three bedrooms, kitchen, and living-room (in one), scullery, pantry, and entrance is as follows:

"(1) *Outside Walls.*—Sills of 4 in. by 6 in., box planed according to detail as shown on design. Waterboard of 1½ in. by 5 in. The wall-planks of 3 in. thick planks planed, as shown on detail V-jointed, tongued, and grooved. The planks are laid horizontal, fastened to each other with dowel-pins. Corners mitred, doubled notching. Inner-sides of outside walls are hung with sulfit rolls and three-quarter inch sheeting planed to match inside walls.

"(2) *Inside Walls.*—Of 3 in. planks formed as the outsides but without sulfit and sheeting.

"(3) *Floor.*—Of 2 in. by 5 in. joists and 1¼ in. flooring boards, tongued and grooved.

"(4) *Ceiling.*—Of five-eighths inch planed boards tongued, grooved, beaded or V-jointed, to be nailed to 2 in. by 4 in. ceiling-joists.

"(5) *Roof.*—Consists of 2½ in. by 5 in. rafters 1 in. planed, tongued and grooved boards on laths for tiles. The tiles are excluded. Bargeboards and finials according to design.

"(6) *Mouldings.*—Skirting 5½ in. No. 177 to all rooms cut in lengths. Cornices No. 193 cut in lengths. Architraves 4 in. by 1 in. for doors and inner-sides of windows. Moulding No. 311 for all inside corners.

"(7) *Doors.*—Five inside doors, four panels deal framing, moulded on both sides 1⅛ in. thickness with mortise locks hinged in solid frames. One sash-door 2 in. thick, mortise lock, and hinged as inner-side doors.

"(8) *Windows.*—Four French windows hung in solid frames with hinges and fasteners, but without

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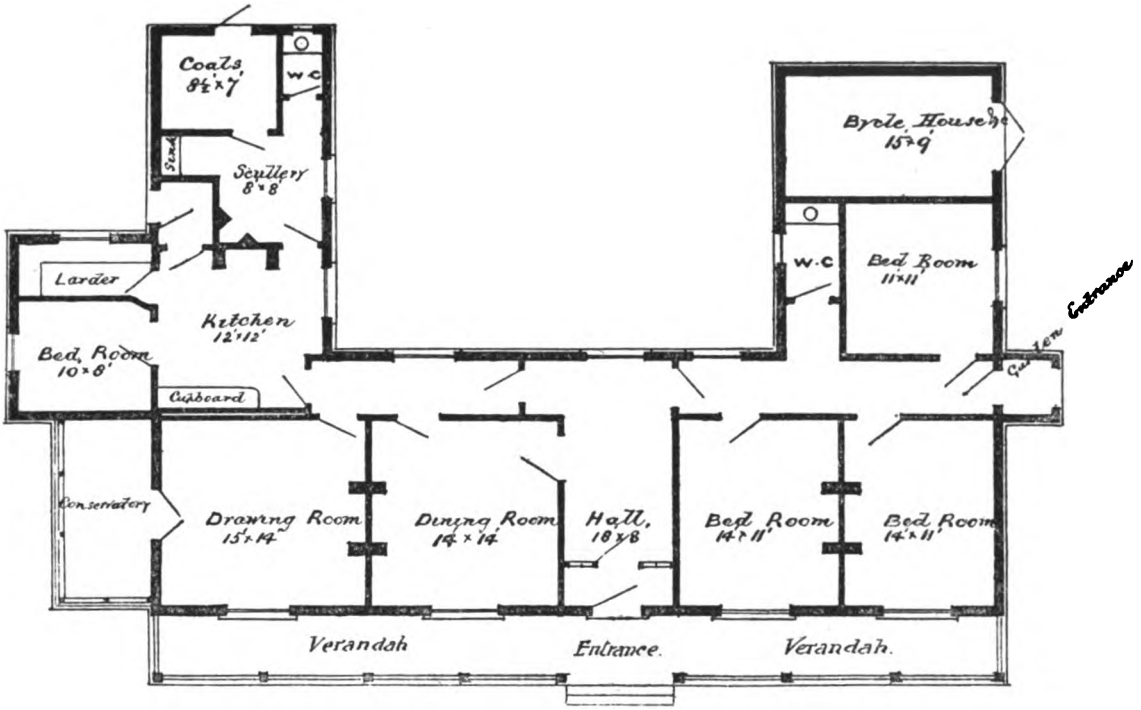


PLAN OF MR. POTTER'S STEEL AND PLASTER BUNGALOW, PAGE 319

glass. Two smaller windows for pantry and scullery.

"These will be the woodwork of all descriptions and locks, hinges, and fasteners to doors and windows.

"What is not provided are the following:

"Foundation, chimney and stove, glass, nails and screws, painting, gutters and tiles, water accommodation.

"The price of the house f.o.b. Christiania will be £92, and the cubical contents for shipping about 960 cubic feet. Freight to London, £8. Root, area 750 sq. ft."

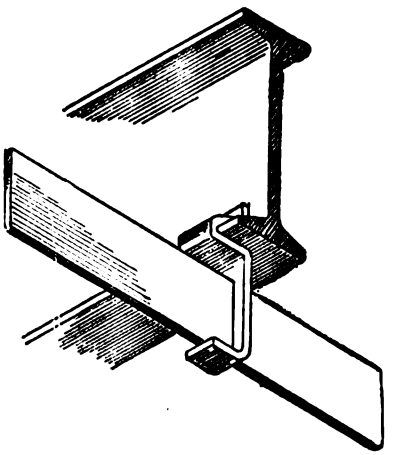
X. AN ARCHITECT'S ADVICE

We have been favoured by Mr. P. Morley Horder, of 148 New Bond Street, London, W., some of whose work has already been illustrated in these articles, with some interesting drawings, and a note, in the course of which he says:

"The cottage at Orpington I consider is of much interest in point of price, considering it is a good small house and presentable on all sides for the money (*see page* 318).

"You will pardon my saying, I venture to think, that with all the interest and value of your able articles, it would have been better to have avoided encouraging the type of elevation developed in manufacturers' offices. Many country districts have been ruined by their temporary structure, which, however ingenious in plan, are ill-considered in elevation. There is no reason why they should not be made presentable if they were only kept absolutely simple—not tricked out to look like more enduring villas, equally objectionable."

Mr. Morley Horder's plea for simple and unaffected designs for rural dwellings will be re-echoed by every one acquainted with what is going on in the country and with the bizarre tastes of so many "bungalow" builders, and is



THE CONSTRUCTION OF A STEEL BUNGALOW

This shows how the lathing-bars are fixed by means of a perforated clip to the steel standard

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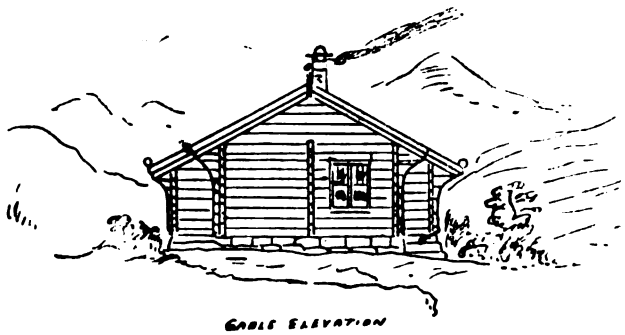
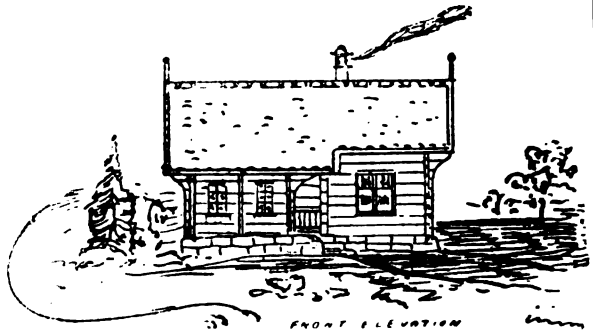
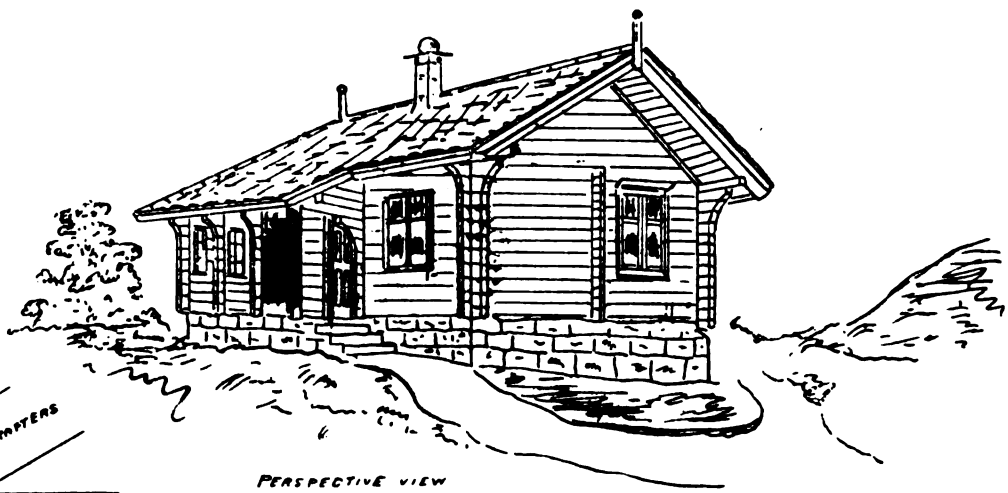


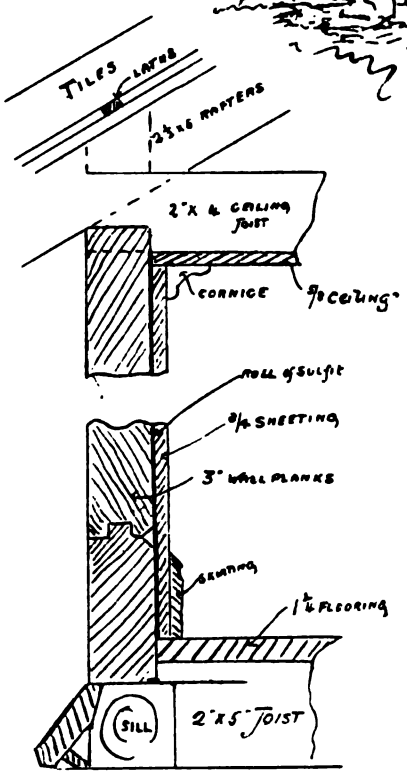
GABLE ELEVATION



FRONT ELEVATION



PERSPECTIVE VIEW



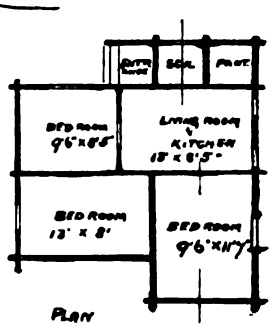
SECTION.

A CHEAP COTTAGE ON THE NORWEGIAN PLAN

PRICE IN NORWAY, £92

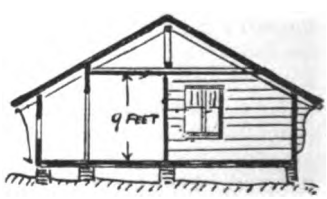
See alternative plan on the opposite page

MR. F. RUSHTON ABLETT



PLAN

HEIGHT OF FLOOR TO CEILING



SECTION.

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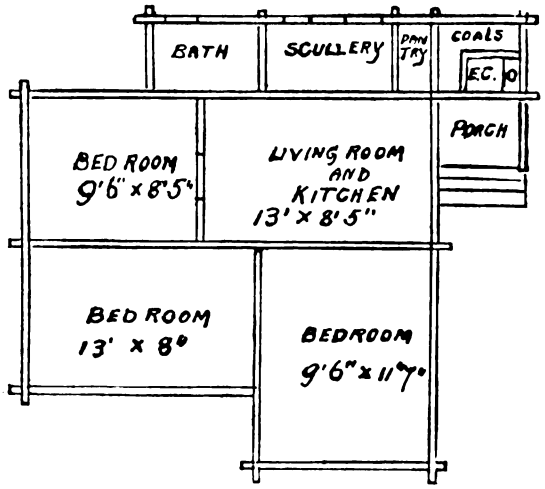
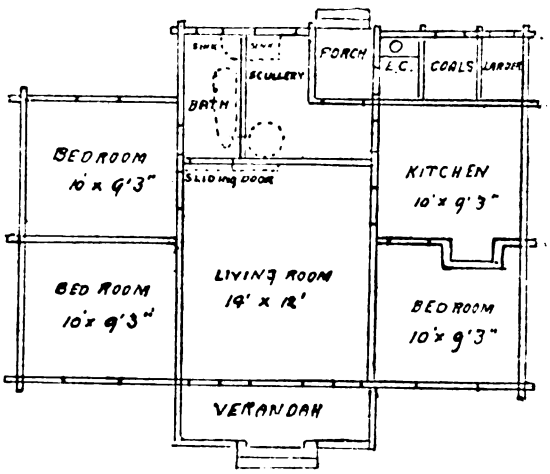
made with perfect propriety by him, for natural treatment is the mark of his own work. With regard to Mr. Morley Horder's criticism of my articles, if I am to be held responsible for all the illustrations I have reproduced I am indeed in a sad case! But I do not think Mr. Horder seriously holds me responsible. For every manufacturer's design I have given, there has certainly been reproduced at least one artist's drawing. I should have been glad to find room for more architect's work had more been sent.

Since Mr. Morley Horder has raised the question, may I suggest that while I have found the architects with whom I have been brought into contact in these articles very good fellows indeed, many artist-designers would probably admit that some of them have possibly a little to learn from the "enterprise" of the contemned "manufacturers"? When country architects take to declaring, as some country architects have declared to me, that they "could not design anything under £300," is it surprising that the large number of folk who have very little more than that sum to spend on "a little place in the country," should wonder whether architects are invariably the most economical designers of small cottages, and turn some of their attention to "manufacturers'" designs?

In addition to the Orpington design which I reproduce, Mr. Morley Horder has also sent his drawings for two most attractively simple and altogether desirable cottages at Meldreth and Milford-on-Sea respectively. The Meldreth cottage was built for £560 and contains downstairs dining- and drawing-room, hall, kitchen, loggia, scullery, coal-house, and lavatory; upstairs, five bedrooms, a bath-room, and water-closet. The Milford dwelling, the cost of which was £950, gives the following accommodation: ground floor: drawing- and dining-rooms, study, hall, kitchen, verandah, conservatory, lavatory, closets, scullery, and coal-house; first floor: six bedrooms, bath-room, linen closet, water-closet, and loggia; also attics.



ALTERNATIVE PLAN—ADDITIONAL COST, £13



SUITABLE FOR LADIES OF SMALL MEANS

The cost, ready for erection on purchaser's foundations, would be £156

XI. HINTS FROM AMERICAN EXPERIENCE

We add some useful hints on bungalow building given by *Country Life in America*, from which, by special arrangement, we are allowed to reproduce several striking illustrations. Here, for example, is the secret for building a chimney that will "draw":

"Have an ample-sized flue. If the flue area is not less than 10 per cent. of the area of the opening of the fire-place below, you will probably have no trouble from smoky fire-places, and, if you do, you will find that the defects are easily remedied. Do not build your fire-places too shallow; and the back of the fire-place should pitch slightly toward the front, narrowing the throat, accelerating the draught, and forming a shelf to stop a down draught."

This matter of perfectly drawing chimneys is so important that I may add the following advice from an English authority:

"Flues should never be less than nine inches square, and for anything above the ordinary fire-place they should be fourteen inches by nine inches. Large kitchen ranges require a flue fourteen inches square. In order to prevent the rain from beating upon the fire and tc stop down-draughts of cold air, a flue must have a sufficient curve within its run to prevent daylight being seen when looking

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up; and this course must be gradual and entirely free from sharp bends where soot could accumulate. It is the usual practice to build the backs of flues and the walls of chimney shafts in 4½-in. brickwork; but this should not be countenanced, as even with the best of work there would be times when, owing to the thinness of the brickwork, it would be found impossible to maintain the necessary temperature within the flue, the chimney smoking in consequence."

The first chimneys I had built were, I remember, mortared inside—the technical word is "rendered" or "parged" with mortar; but I have since learnt this is not so good—it is liable to crack—as the old-fashioned substance consisting of three parts of cow-dung and one part of lime which on another job of mine I noticed an old bricklayer using.

The matter of good window-glass is often overlooked, and on this matter our American adviser writes wisely:

"Either make up your mind to pay for plate-glass, or else expect to have more or less wavy and distorted views from your windows. The effect of plate-glass from the exterior is very seldom realised. A very plain and simple house with plate-glass windows will often produce a much richer and more elegant effect than ten times the cost of the glass spent in ornamentation in another house where cheap glass is used in the windows."

With regard to "The Spinsterage" drawing, one notes particularly the lowness of the windows. Dormer and casement windows are usually placed so high that a person sitting down cannot see out. The studding on which the walls of deal are nailed shows on the inside. It is placed about twenty inches apart, and is tied together by cross-pieces, which make shelves for pictures and bric-à-brac.

"The upper floor [writes the Spinster] forms the ceiling of the rooms below. A five-foot attic keeps the chambers cool, and furnishes storage-room and a place for water-tanks.

"Water is raised from two large cisterns under the house by means of a force-pump placed in the kitchen. The spinster's unaided muscle can pump this water to the old oil-barrels, which serve as storage-tanks in the attic, whence it descends to the bath-room.

"The two chimneys are of ordinary red brick set on firm foundations. Asbestos paper is placed between bricks and woodwork—a precaution which country builders usually omit."

The cost was:

	$
Cellar and foundations	73
Chimneys	76
Lumber	598
Hauling (about)	20
Freight (about)	40
Hardware (nails, paint, &c.)	75
Extras, including boy-help and odd jobs of finishing and painting	112
Contractor, carpenters, and chimney builder	500
Two cisterns of masonry, with brick-filtering partitions	70
Plumbing, including pump and kitchen sink	50
	$1614

Or, say, 300 guineas. Labour cost from 4*s.* 2*d.* to 12*s.* 6*d.* a day. In another article in our contemporary we find the statement that "at the present day it would be practically a waste of time to try to build for one's self a cottage suitable for all-the-year-round occupancy" in the American climate for a great deal less than £1000.

In the case of good housework in England, I have seen it stated that labour is about 47 per cent., and materials about 53 per cent., of total cost. Country bricklayers and carpenters receive from a penny to three-ha'pence an hour less wages than their London fellows. In comparing the different materials of which bungalows may be built, it is useful to remember that the proportion of cost of each trade in ordinary building work is roughly: bricklayer, 33 per cent.; carpenter, 30 per cent.; with the plumber, slater or tiler, plasterer and painter, glazier and paper-hanger following with from 7 per cent. to 5 per cent.

Mr. M. B. Atkinson has sent me a copy of the "building edition" of another American magazine, the *Scientific American*, issued some years ago. With its advice, to take enough trouble in planning a house when it is the house to which you propose either to "retire" to for good or to spend your weeks of recreation, I must close this series of articles: "A house is built to be lived in. Everything counts, everything helps, everything may injure. A pleasant porch, agreeably spaced windows, a pleasing roofing line, a fine chimney—nothing is too small, unimportant, insignificant to play its part in adding to the attractiveness of the house."

[*This series of articles, which has attracted such widespread attention, and proved of such practical use, will shortly be reprinted, with considerable additions, in volume form.*—EDITOR.]

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"PAWNBROKING AND THE POOR": A REPLY ON BEHALF OF THE TRADE

[As the National Pawnbrokers' Association of Great Britain and Ireland considered that serious injustice was done to their trade by an article published by us two months ago, we willingly placed our columns at their service for an official reply, our only desire being, in this as in all cases, that the truth shall be known, and that under no circumstances shall any injustice be done to an individual or a class. We print the following reply as we have received it, with the exception of certain irrelevant personalities concerning the writer of the original article.—EDITOR.]

THE article in the December number of THE WORLD'S WORK dealing with the subject of Pawnbroking and the Poor has given rise to strong protest on the part of those carrying on the business, through the sweeping assertions and serious charges hurled against them by the writer, Mr. H. R. Boyle. Permission has been therefore sought by the Association chiefly representing the Pawnbroking Trade of the country, to briefly review the allegations put forward. When the pages of a monthly magazine are made available for attacks of this sweeping character, the unsuitability is at once manifest, as such controversial matter cannot be adequately or fairly dealt with to both sides, and the advantage necessarily obtains to the attacker from the length of the start given before any reply becomes possible.

Pawnbroking in Great Britain is conducted under the Pawnbrokers Act, 1872, which was the outcome of a select Committee of the House of Commons, which sat in 1870, and received a vast quantity of evidence extending over some thirteen days. The profit fixed by that Act was at the rate of one halfpenny per florin per month up to the sum of £2, or 25 per cent. per annum; above that amount one halfpenny per half-crown, reducing the rate to 20 per cent. For sums over £2, the Act also permits of special contracts being entered into where the rates are mutually agreed upon, as well as the term of the loan, providing it is not less than three months. Singularly enough, this venture into the precincts of Free Trade has not been made use of to anything like the extent that was anticipated at the time of passing the Act. Every ticket issued by the pawnbroker contains an abstract of the Act, setting forth in a clear and precise manner the profit he is entitled to charge, together with other essential information. Any excess upon these charges brings him directly under the penal clauses of the Act, with which it positively bristles; almost any of these clauses may be put in motion by application to a magistrate. As regards the charge made of a pawnbroker evading Stamp Duty on special contracts and wriggling out of the provisions of the law, it is one of the many absurd statements made in the article. The Pawnbrokers Act exempts these contracts from Stamp Duty, to the benefit of the borrower.

It should be distinctly noted that the Pawnbrokers Act allows *profit;* this word being used instead of *interest*. The Select Committee recognised the very important distinction between the two, for the obvious reason that *interest* is a misnomer, when it has to be taken into consideration the amount of labour and expense incurred in the receiving, booking, insuring, storing, and delivering the pledges dealt with. The word *profit* was therefore deliberately adopted by the Legislature. When it is sought to make a great point about the enormous *rate* of interest a pawnbroker is by law permitted to charge in the case of small pledges, it becomes quite ridiculous when applied in actual working experience. Instances have been quoted where a person making a pledge, say of a coat, for one florin for three days, pays the enormous rate of 500 per cent., which means that he pays the sum of one halfpenny for the accommodation in addition to the initial charge of one halfpenny for the ticket; of course he would pay no more for thirty-one days. It is perhaps a little beside the question raised, but if the coat had been deposited at a railway station cloak-room, a charge of twopence for forty-eight hours would be demanded. Picture to oneself a

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heap of such pledges numbering one thousand; well, this crushing rate of interest for dealing with such a large quantity of goods would amount to £2 1s. 8d., collected in halfpence from a thousand different customers. To any one unacquainted with the labour attending the management of a pawnbroking business doing largely with this class of property, such a spectacle as this heap of one thousand parcels would be simply appalling. This reference to the florin pledges is purposely made for the reason that the classes who avail themselves the most frequently of the services of the pawnbroker do not borrow large sums at a time. It is estimated that apart from transactions above the sum of £10—to which the Pawnbrokers Act has no application whatever—the average advance made upon pledges—with the exception of a small number of pawnbrokers dealing exclusively in plate and jewellery—does not largely exceed the sum of 4s., so that when comparison is made with the State and Municipal systems existing on the Continent, where a general average per pledge would approximate more nearly the sum of 25s., it will be evident to any ordinary observer that the conditions are altogether different and quite illusory. In this country the rate of advance upon property is appreciably higher than under foreign systems. To any one urgently requiring use of money in exchange for the deposit of collateral security, it is of far more importance to be able to obtain as large an amount as possible, promptly, and with no unnecessary publicity. This, it is claimed, the English system allows of, and in practice it is fully attained.

Another unsubstantiated charge is made that under the Pawnbrokers Act, pledges for 10s. and under pass into the possession of the pawnbroker without the rights of an ordinary mortgagee attaching thereto, and that the pawnbroker is immeasurably enriched thereby. Just to impart a little trade secret, it may be permissible to state that, singular as it may appear to some, the pawnbroker depends for success in his business—equally with the wholesale man and the ordinary retailer—upon the number of times he can turn over his capital in the course of a year, and he is thus tempted to compete for business (a phase altogether non-existent in the State systems), the result to him being that he finds each month he is in possession of an accumulation of property which it becomes necessary to realise upon, and unless he is prepared to embark in altogether another branch of trade by retailing these forfeited goods to the public, there is nothing for him to do but dispose of them in bulk. To profitably conduct the disposal of pawnbrokers' forefeited goods to the general public, quite a large business becomes necessary and comparatively few pawnbrokers are in a position, or care, to enter upon the task. It therefore remains to accept the only alternative, and dispose of the goods in bulk, which he has to do at a sacrifice in nearly every case by a loss ranging from 5 per cent. to 25 per cent. on the sums lent. Such a statement as this will be received by the writer of your article with incredulity, but nevertheless, it can be most incontestably proved by evidence of the most direct character.

Upon pledges above the sum of 10s., a totally different system prevails, and it is, that all forfeited goods are required to be sold by auction and an account rendered to the pledger, on demand, of the result of the sale. In London alone the firms of auctioneers conducting this class of business dispose of at least 6000 lots per week throughout the year, and every pledger, if he chooses, has the right under the Act to require an independent statement from the auctioneer, as to the amount realised for any particular pledge. If the same principle was applied to the smaller pledges, of 10s. and under, the expense of recording all the transactions would bring up the loss on forfeits to at least 50 per cent. of the advance, thus rendering the conduct of this branch of the business wholly impossible. All this was considered when the Select Committee of the House of Commons dealt with the subject. To talk about the automatic transfer of property from the pledger to the pawnbroker by Act of Parliament is pure nonsense. A pledger is unable to demand an account for a pledge of 10s. or under from the difficulties recognised by Parliament, but with any pledge above that sum he has a perfect right to an account and it is a right constantly exercised by the pledger. The allegation of "faking books," where auctioneers of the highest standing are concerned, and where the volume of business is so extensive, is far too silly to be seriously treated.

It now becomes necessary to deal with the more serious charges made in the article written by Mr. H. R. Boyle. The statement that:

> "The Metropolitan Police are well acquainted with the fact that a large number of pawnbrokers are closely in touch with the receivers of stolen goods, as also with professional thieves,"

is absolutely false, and quite incapable of proof;

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there is not the least shred of foundation for such a reckless assertion, and no authority could more effectively dispel such a statement than the Scotland Yard officials themselves, who do continually bear witness to the help given by pawnbrokers in the detection of crime. In London alone, something like forty million pledges are received annually. It is little wonder that out of that total quite a considerable number should be improperly pledged, and doubtless such is the case. The professional thief does not visit the pawnbroker, he knows a far safer medium in the professional receiver, a far different person to the tradesman who openly carries on his business under licence. Instead of the pawnbroker being such a felon as pictured, as a matter of fact he renders a far larger measure of assistance to the administration of justice at the present day, than any one other trade, or calling, in existence; inasmuch as the Act of Parliament under which he conducts his business exacts very precise methods for doing so, and this system acts, to a large extent, automatically in securing the conviction of prisoners charged with theft. The astute modern police officer, when he takes a prisoner and is making his search, looks first for any pawn-tickets that may be either on his person, or at his dwelling, knowing full well that he is then in possession of the possible means of identification of property. The consequence is that a ready help to a conviction is obtained. Had the property passed to a professional receiver all trace would have been immediately destroyed. In about 90 per cent. of the cases where pawnbrokers have unwittingly received in pledge stolen property, they have to lose the whole of the advances made upon the goods, in addition to spending a considerable time in attending the Courts, and assisting to secure a conviction. The simple and conclusive deduction to be drawn from this condition of things is, that it would be impossible for them to carry on the business of a licensed pawnbroker, and at the same time be receivers of stolen property. The fact of a pawnbroker having to lose the money he has lent helps largely to show that the amount of stolen property coming into his possession must be of the most infinitesimal proportion compared with the volume of his business. To everybody of ordinary common sense and justice, possessing any knowledge of the business, this fact should be the most convincing. To apply the misdeeds of each individual to the whole community is most unreasonable and grossly unfair. It might as well be said that because a clergyman has been found guilty of drunkenness or immorality, the whole of the clergy are social lepers, or because a solicitor has misappropriated his clients' money, the whole of the legal profession are thieves. Because we frequently read in the morning paper that a butcher has been fined for having unsound meat on his premises are we justified in calling the whole of the meat trade poisonous? It is absurd. Then why should the pawnbroker be pronounced guilty of such abominable practices, when there cannot be found a single instance of one of their number so demeaning himself?

Other grave charges made are those of entering into conspiracy with sellers of pawntickets to defraud the public, and the sweating and filing articles of jewellery pledged. In the United Kingdom there are more than forty Associations of Pawnbrokers, not one of which but would drum out from its ranks any member who was known to be guilty of this despicable form of conspiracy, fraud and theft. The space available to reply does not admit of exhaustively dealing with all that has been written to blacken the character of the pawnbroker. The customers of the pawnbroker know, as a rule, exactly the accommodation they require, and they generally see that they get it; the competition existing for business assisting them materially in doing so.

Perhaps no better proof that the pawnbroker, as he is to-day, does not deserve all the ill things that have been said of him can be offered than by pointing to the large number of members of the trade holding municipal and other offices all over the kingdom—offices to which in most instances they have been elected by the suffrages of their fellow townsmen. The Metropolis is too large for him to stand out so conspicuously as he does in the Provinces. The Pawnbrokers' Almanack for 1905 gives a list of those pawnbrokers holding high positions, from which it may be seen that there are one Mayor, one Deputy Mayor, thirty-nine Justices of the Peace, twenty-three Aldermen, ninety-one Councillors, all of whom are, or were until recently, actively engaged in the pawnbroking business, while a large number of others hold positions of importance in the Church and other religious denominations. In the year 1900, five pawnbrokers filled the Mayoral chairs of their respective towns. Besides maintaining several very excellent charities for the relief of the sick and decayed members of their own trade, pawnbrokers are as liberal contributors to the removal of distress, as constant subscribers to benevolent funds, as any other

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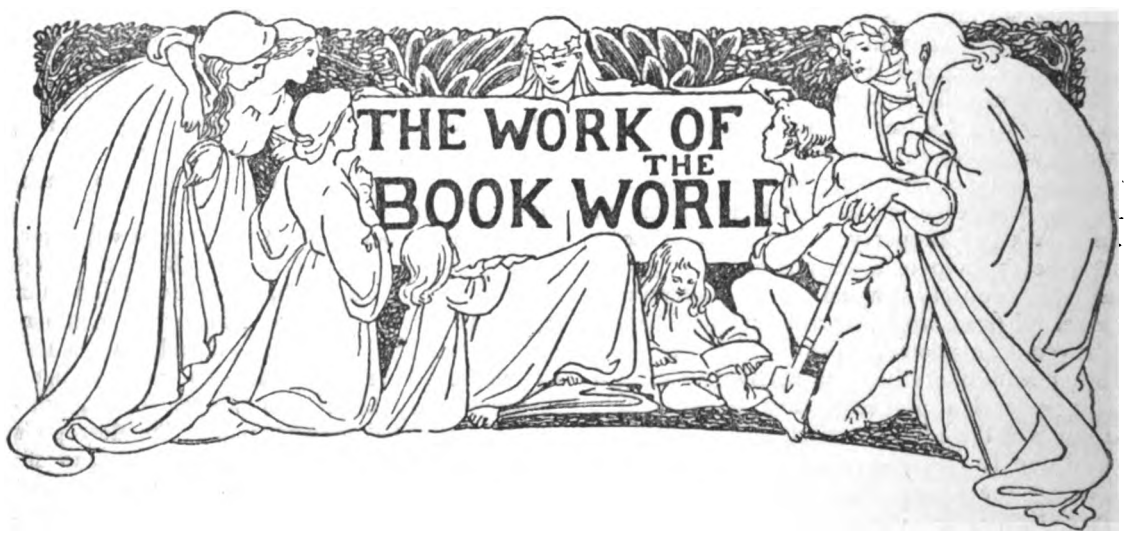
body of men with whom in point of wealth and numbers it may be just to compare them. Men of eminence in Parliament, the Church and Literature, who have taken the pains to probe beneath the surface and to examine with attention and impartiality the working of the business have all testified to its usefulness, and to the upright conduct of its members.

Twelve months ago (December 30, 1903), Father Bernard Vaughan, addressing a meeting at the People's Palace, Mile End, said he was often told that it was useless to give any clothes or to help to buy furniture for poor people, because they at once took them to the pawnshop. Then, with a dramatic change of attitude, and in a voice that rang out like a challenge he exclaimed, "And I stand here to-night to thank God for the pawnshop." The roar of approval that greeted these words was instantaneous and showed how well they had gone home. "If it were not for the pawnshop this winter," he added, "death would stalk through every street in the Mile End Road."

It is thirty-three years since the present Act came into operation. During that period rent, rates, taxes, and wages, have all increased considerably, and have rendered the pawnbrokers' business less profitable than when the Legislature carefully dealt with the rate of profit, and any possibility of conducting the business by private enterprise at a lower rate of remuneration is out of the question.

CHAS. JAS. THOMPSON,
Hon. Sec. National Pawnbrokers' Association of Great Britain and Ireland.



LONDON, *January* 13.

THE much-disputed question of family-written biographies is again raised by the two volumes of *Memorials of Edward Burne-Jones* (Macmillan, 30*s.* net), by his widow. Taking into consideration the descriptive title of this book—for it does not stand as a formal biography—the reviewer can but say that Lady Burne-Jones has added weight to the affirmative side of the argument.

An Artist's Life

She has written a worthy, full, and wholly fascinating book. It has just that touch of home life and of intimate description which goes so far to make up for the loss of the detached and critical narrative of biographers of the other sort. She gives the best explanation, defence maybe, for writing the book herself. In one place she says:

"Edward himself questioned the possibility of writing the biography of any but men of action. 'You can tell the life of those who have fought and won and been beaten,' he said, 'because it is clear and definite—but what is there to say about a poet or an artist? I never want a life of any man whose work I know, for that is his day of Judgment, and that is his doom; the shapeless mess that other people make for one to deal with I won't have called a life. It's more like one's

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death—so many things are one's death more than the pale face that looks in at the door one day. My life is what I long for and love and regret and desire.' Yet he realised in late years that some memorial of him would certainly be written, and even spoke to me once of the possibility of my doing it. The reason he gave for wishing this was uttered almost parenthetically—' For you *know*.' And although he never returned to the subject again those words give me courage."

Certainly Lady Burne-Jones does *know*, and there has rarely been a more intuitive revelation of the loves, the desires, the regrets, of a notable man. For Burne-Jones was more of a man than many a greater artist has been. A man may have a genius for material expression and yet give no other outward sign of the soul within him. But this man had thought out for himself a definite scheme of life, a philosophy, he had almost founded a school, and even if his pictures had never received the notice they did, the record of his life would have been worth preserving. It seems harsh to say but it is surely true that the artistic movement of to-day is tending apart from Burne-Jones and all he represented. Realism cannot last for ever. One would think also that the literature of the artistic movement with which Burne-Jones was so prominently associated would long since have been in danger of overwriting. Undoubtedly this is true in so far as the Rossettis are concerned. But what Lady Burne-Jones has to tell of this wonderful group, particularly of her husband's lifelong relations with William Morris, is so well chosen and so interesting that the idea of useless repetition never arises. The story of how the young theological student from Birmingham deserted the church for the studio is fully told, often in sparkling letters from the young man himself, many of which give a bright picture of Oxford life in the fifties. Burne-Jones' meeting with William Morris there in 1853 is described in these lines:

"In Oxford Edward found much that he never expected, but not the thing for which he looked. He had believed that health and strength for the life he had chosen must await him in the University, which had so lately been the centre of a great religious movement. Newman's simple and lofty exhortations had sunk into his heart, and created there such belief in the writer as to make even his secession to Rome seem an act upon which it was impossible to pass judgment, and which time alone could show whether he himself might not feel bound to follow. To him t was like a room from which some one he loved had just gone out, and where at every turn he would find traces of his friend. But when he got there the whole life seemed to him languid and indifferent, with scarcely anything to show of the fiery time so lately past. In his disappointment he turned around, seeking his way in unlooked-for loneliness of spirit, and there, shoulder to shoulder, stood his life's companion.

"They had met the year before, when they were both up for matriculation, and even sat side by side in the hall of Exeter, but had not spoken to each other. Edward recognised him, because at that time he had been struck by the appearance of his neighbour, and had noticed also that he finished a Horace paper early in the morning and folded it and wrote upon it the name of 'William Morris.'"

From this time on, the life of Burne-Jones becomes largely a dialogue of the influence of the two friends upon each other. Their remarkable intimacy continued to the day of Morris's death, and even if in the end they grew apart through the Socialism of the latter, there is no doubt that artistically and in spirit they were always brothers. Rich as these volumes are in Morrisiana, they add much that is new and interesting to the oft-told story of the Rossettis. Gabriel Rossetti appears here in what was undoubtedly his most influential *rôle*, that of inspirer and teacher to enthusiastic youth. He seemed to exercise a greater influence on Burne-Jones than Morris did, or at any rate his teachings were more unquestionably accepted. Until the time of his wife's death and his own relinquishing of all interests, artistic and otherwise, he seems to have been for years a fountain head of inspiration for Burne-Jones and his other disciples.

The prominent events in the artist's life are described in great detail, and in many cases bring to the reader a full understanding—for instance in the case of his resignation from the Royal Academy, about which so many stories are told. Also inexhaustible is the fund of anecdote and experience which might be selected from the volumes. The clear fine spirit of the man constantly emerges, as in this letter to his nephew by marriage, Mr. Rudyard Kipling, on the appearance of "Plain Tales from the Hills":

"I want to send you a greeting and tell you with what delight and pride I have read your tale-book—read it this week, being disabled for work, and it was a mighty comfort and beguilement for me—I don't know when I have so enjoyed a tale-book, and it would be a shame if I didn't write a word of congratulation, though God knows I do hate letter-writing of all mortal things. All the time I kept seeing the little chap—

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square built chap—that I was downright fond of 'fifty' years ago. and I don't think you have changed a bit, nor I much.

"I won't write a line of criticism, I do so hate the jargon of it—even in the best hands I dread it and scuttle out of its company—it's enough to tell you I read every line with deep interest and an admiration I wouldn't qualify even if I thought it good for your soul, so abundant it is. And I look forward to Mother Maturin. But sure nothing is so nice as a book of little tales, when if they are tragical they are not long enough to harrow the heart too much, and if they are merry, the gods are not likely to envy us ten minutes of fun. Dear Ruddy, this is a truth, your work will be a new pleasure for me in life."

One of the most attractive friendships of the painter was that of Dr. Sebastian Evans, begun in 1885 and grown into a serious companionship differing from those which bound Burne-Jones to the friends of his youth. They shared a world of thought and principles which they seldom put into words, and there grew up between them a sort of accepted formula which they called "talking after the manner of the ancients." This species of Socratic dialogue helped open speech, and it is from one of those quoted that we give a noble passage, which, aside from the beauty of its thought, shows its author to have been no mean artist in words:

"What you have to do is to express yourself—utter yourself, turn out what is in you—on the side of beauty and right and truth, and, of course, you can't turn out your best unless you know what your best is. . . . What I am driving at is this: We are a living part, however small, of things as they are. If we believe that things as they are can be made better than they are, and in that faith set to work to help the betterment to the best of our ability, however limited, we are, and cannot help being, children of the Kingdom. If we disbelieve in the possibility of betterment, or don't try to help it forward, we are and cannot help being damned, it is the 'things as they are' that is the touchstone—the trial—the Day of Judgment. 'How do things as they are strike you?' The question is as bald as an egg, but it is the egg out of which blessedness or unblessedness is everlastingly being hatched for every living soul. Of course you can translate it into any religious language you please; Christian, Buddhist, Mahometan, or what not. 'Have you faith?' I suppose means the same thing. Faith, not amount of achievement—which, at best, must be infinitesimally small—that is the great thing. Have *you* faith, my dear? Do you ever think of this poor old woman, our Mother, trudging on and on towards nothing and nowhere, and swear by all your gods that she shall yet go gloriously some day, with sunshine and flowers and chanting of her children that love her and she loves? I can never think of collective humanity as brethren and sisters; they seem to me 'Mother'—more nearly Mother than Mother Nature herself. To me, this weary, toiling, groaning world of men and women is none other than Our Lady of the Sorrows. It lies on you and me and all the faithful to make her Our Lady of the Glories. Will she ever be so? Will she? Will she? She shall be, if your toil and mine, and the toil of a thousand ages of them that come after us can make her so!"

Mr. Stephen Phillips

We do not know whether the publication of Mr. Stephen Phillips's latest poetic drama *The Sin of David* (Macmillan, 4*s.* 6*d.* net), means that its appearance on the stage is indefinitely postponed. There has, at any rate, been no renewal lately of the gossip concerning its production. But the study gains what the theatre loses. No one who takes up the little volume is likely to put it down unfinished, for it is a moving story, told with all this poet's well-known fluency and brilliancy. It does not make for spectacular production, for the scene is laid in dull times, the drab days of the Commonwealth. Aside from the fact that the heroine is called Miriam, there is little beyond the title to remind the reader of the Biblical tragedy of which it is the prototype. (It is noticeable that within a few months a novelist like Miss Wyllarde in "Uriah the Hittite" had used precisely the same theme in quite different surroundings.) This is a story of how Sir Hubert Lisle, a commander of the Parliamentary forces in the Fen-land, fell in love with the girl wife of an ancient Colonel of his own army; and how in order to rid himself of the husband he "set him in the forefront of the hottest battle, that he might be smitten and die." Punishment came swiftly upon the Puritan David and upon his wife, even though she was innocent of his crime against her former husband. Their child, adored as only children are, is taken from them suddenly, almost without warning, and by his death-bed the puritan David confesses his crime. In a very moving scene the two agree to separate over the two graves which divide them, but in the end, through the arguments of the husband, the wife consents to go with him away in

"Marriage at last of spirit, not of sense,
Whose ritual is memory and repentance,

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Whose sacrament this deep and mutual wound,
Whose covenant the all that might have been."

But as brief and as uncumbered as his story is, Mr. Phillips has embroidered it in gorgeous fashion with some of the most beautiful lines he has written. The child-wife, speaking to her husband's maiden sister, speaks thus of woman's fate:

"*Miriam:* O thou dear Martha, living without sin,
And reputably rusting to the grave,
Thou vacant house moated about by peace,
Thou shadow perfect, and thou blameless ghost,
I cannot feed my soul on 'Thou shalt not.'
I'll fight 'gainst numbness, wrestle against rust.
There's the arch-foe of women! this doth kill us.
Not pain, nor secret arrow of the midnight
That quivers till the bird-song, ended faith,
Mortal surprise of marriage, nor the dawn
Of golden-vista'd children clouded quite,
Nor fallen loneliness where love hath been.
These, these are understood, wept o'er and sung.
But worse, O, worse the folding of the hands,
The human face left by the tide of life,
The worm already at the human heart."

And in another place she answers in these noble words the jealous plaint of the husband that the child has taken a love that once was his:

"*Lisle:* And now doth he divide what once was mine wholly.
"*Miriam:* Ah no; he hath enriched that love.
Once did it live upon thy look, thy voice,
Thy strength, thy courage, and thy conqueror soul,
This was enough, God knows. But, Hubert, now
We two together to behold our boy,
That we have reared and planted sunward grow,
While all our sighs like breezes come to him,
And all our tears fall down on him like rain.
I thought thou never couldst be more to me;
But now is added to that rapture fire
Much that perhaps of men is not esteemed,
But to a woman meaneth half her life.
To hold our sweet night council o'er his day,
To exchange bright understandings silently
At little words of his; to bend, we two,
Over him dreaming while thy hand on mine
Tightens a moment; then to watch together
Some little way of me or thee appear
Sudden in him; to feel our daily life
Grow solemn at his voice: to see our spirits,
Close though they met in kiss and breathed word,
Visibly here commingled and made flesh."

Mrs. Maybrick's Fifteen Years

Lord William Nevill and Mr. Adolf Beck have between them very thoroughly covered the ground of the treatment of men in English prisons; but neither has given so vivid an account psychologically of prison experience as that just published by Mrs. Maybrick under the title *My Fifteen Lost Years* (Funk and Wagnalls, 6s.). It is doubtful if, during the whole of the last century, there was a more noted prisoner than this American woman who was first condemned to death and afterwards sentenced to imprisonment for life for the murder of her English husband. To say the least there was always the shadow of a doubt in favour of Mrs. Maybrick's innocence, of which she does not seem to have had the benefit. Thousands of people both in her native and her adopted country believed in her innocence, and kept up for years an unceasing if unavailing crusade for her pardon. She was, however, allowed to serve out her "life" sentence which by various systems of reduction for good conduct was narrowed down to fifteen years. In writing her experiences Mrs. Maybrick disclaims any personal desire for the continuation of the agitation so long surrounding her. She says:

"In returning to my dear native land, after a long imprisonment, I cherished the hope that I might as far as possible be permitted to take up the threads of outward existence so cruelly broken, little dreaming that trials hardly less grievous than those I left behind awaited me; for no sooner had I touched these hospitable shores, when I was met by the fear-inspiring cry, 'You must write a book—you must give the world an account of your sufferings'—as if one could never suffer enough. My well-meaning friends could hardly have known what they were asking in forcing upon me a mental return to the dread past. Solitary confinement in Woking prison was not such an Elysium that one should voluntarily desire to harp back to it, nor is penal servitude in Aylesbury an Arcadian dream. While within their grim walls I did my best to exclude from thought the world without; and now that I am once again in the world, though scarcely of it, my one desire to shut out all the abhorrent things which so-called prison life stands for has thus far not only failed of realisation, but, under conditions even more trying than the repressive prison *régime* (because of the free and happy life all about which it seemed to poor me that I had some right to share), I have been compelled by force of circumstance to return to my cast-off prison shell, and live all the old heart and brain crushing life over again. However, my second

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trial and imprisonment like the first is at last drawing to a close; and I devoutly trust that I shall be now permitted to enter upon a long coveted rest, and partake as I may of those tempered joys which my countrymen by their beautiful sympathy have so chivalrously endeavoured to make possible for me."

For the general reader Mrs. Maybrick's story is chiefly interesting for the account she gives of her prison experiences. There is little new to be learned either from her account of her trial or from the arguments given of her own or her attorney's counsel, as to her guilt or innocence. Seldom if ever before has a woman brought up in gentle and refined surroundings written so strikingly of the mental and physical degradation which prison life compels. Certainly Mrs. Maybrick's sufferings were mainly mental. Her prison toil does not seem to have been over-severe. And however rough and rude the food and lodging given it seems on the main to have been all that could be expected under the circumstances. In other words, in spite of various grievances and suggestions, it is not likely that Mrs. Maybrick's story will effect any reform in prison management. If she was innocent and had to suffer these things it was of course an unspeakable horror. If she was guilty, as the State had judged her to be, the treatment would seem to have been not at all too severe. The chief punishment for a refined prisoner is undoubtedly mental. "The voiceless solitude, the hopeless monotony, the long vista of to-morrow, to-morrow, to-morrow, stretching before her, all filled with desolation and despair." Mrs. Maybrick makes much of the terror of enforced silence. The torture of continually enforced silence is known to produce insanity or nervous breakdown more than any other feature connected with prison discipline.

Perhaps the next greatest trial to a woman of this character was the constant supervision of severe officials. Every day the person and cell of the prisoner are ruthlessly searched. She is never trusted out of sight, and at night the watchful eye of the night-officer can see her by means of a small glass fitted to the door of each cell. Also particularly interesting is Mrs. Maybrick's account of her release at the end of fifteen years, and her return to the living world. In closing her record she says:

"A time will come when the world will acknowledge that the verdict which was passed upon me is absolutely untenable. But what then? Who shall give back the years I have spent within prison walls: the friends by whom I am forgotten; my children to whom I am dead; the sunshine; the winds of heaven: my woman's life, and all I have lost by this terrible injustice? Time may heal the deepest wounds when the balm of love and sympathy is poured unto them. It is well; for if mental wounds proved as fatal as those of the body, the prison death roll would indeed be a long one."

Transatlantic Jokes

Often it is quite difficult for the British reader not only to appreciate but even to understand present forms of American humour. Fun-making, like any other pursuit, is to a certain extent the victim of its own productions, and the humourists of America seem to have found fun for their readers in people and things which to readers here are yet matters of more or less solemn fact. Yet even in one of these very local books we find now and then a sparkle which proves the public of both worlds akin. One of the latest importations of this sort is called *The Foolish Dictionary* (Dean and Co.). It calls itself "an exhausting work of reference to uncertain English words, their origin, meaning, legitimate and illegitimate use, confused by a few pictures." The compiler perpetrates a very bad pun when he calls himself "Gideon Wurdz." The book is in the form of a dictionary, and every now and then a definition may provoke a smile, but sometimes smiles are pages apart. For instance, down the letters of the alphabet we find things like these:

"*Adversity:* A bottomless lake surrounded by near-sighted friends.

"*Alcohol:* A liquid good for preserving almost everything except secrets.

"*Augur:* One who bored the ancients with prophecies.

"*Barber:* A brilliant conversationalist who occasionally cuts and shaves hair.

"*Bicycle Skirt:* An abbreviated garment that makes women look shorter and men longer.

"*Chauffeur:* A man who is smart enough to operate an automobile but clever enough not to own one.

"*Cynic:* A man who knows the price of everything and the value of nothing.

"*Drum:* Something noisy and made to beat.

"*Drummer:* Something noisy but impossible to beat.

"*Island:* A place where the bottom of the sea sticks up through the water.

"*Mark:* In Germany twenty-three cents. In the United States only Twain.

"*Mouse:* The frequent cause of a rise in cotton.

"*Policeman:* A never present help in time of trouble."

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About our Canals

A great deal has appeared in this magazine concerning the improvement and greater use of the inland waters of the country, and for those who wish to pursue the matter further no book could be more illuminating than *Bradshaw's Canals and Navigable Rivers of England and Wales* (Blacklock, 21s. net). The work contains all information other than financial necessary for those who are interested in the problem of inland navigation. The author, Mr. De Salis, has spent eleven years in a personal inspection of the whole of these waterways, having travelled over 14,000 miles. The book contains chapters explanatory and descriptive of the rivers and canals, methods of navigating them, the types of vessels used as well as full tables of through routes between important inland centres and seaports. There are also excellent maps and diagrams showing locks, tunnels, towing paths, tidal information.

The Art of Advertising

Twenty years ago it would have been impossible to foresee the development of the modern school of advertising. The work of the publicity maker is so constantly with us that we do not realise the ingenious labour expended upon its production. It requires material evidence such as is given in a volume like the *Advertisers' A B C*, which is another name for T. B. Browne's Standard Advertising Press Directory for 1905 (Browne, 10s. 6d.). This excellent annual is in its nineteenth year, and it is needless to say that each succeeding volume is larger and more all-embracing than the last. There are very well-written chapters upon the following subjects, among others: Advertising as a Motive force in Business; The "Follow-up" system and Business Booklets; British Colonies, a Profitable Field for British Traders; The United States as a Field for Business Enterprise; Advertising on the Continent. There are, of course, lists of the circulations claimed for various papers, a record of periodical births and deaths, and what practically constitutes a survey of the advertising field of the whole world. It has been the aim of the editor to embrace in the volume every feature of possible service to advertisers. What is particularly noticeable is the representative list selected from the 22,000 American publications listed. There are very few people in business who do not use some manner of advertising during the year, and the A B C should save even the smallest advertiser time and trouble.

Miscellaneous

Those who are interested in the furtherance of our foreign trade by promoting the study of foreign languages among commercial students, will be greatly interested in the little book by Mr. Albert Emile Davies, called *The Foreign Correspondent* (Simpkin, Marshall, 1s. 6d. net). The book is a compendium not only of advice upon the foreign languages necessary for commercial purposes, but of information as to how a foreign correspondent should carry on his work. It will find a useful place in every business office.

Whoever is in need of an up-to-date and comprehensive set of maps and tables cannot do better than inspect the new revised and enlarged edition of *Philip's New Handy General Atlas of the World* (Philip and Son, 21s. net). This atlas possesses all the advantages of large scale maps bound up in convenient form and exhaustively indexed. What makes it of more value to people in this country is that it is wholly of English origin and manufacture, planned with special reference to the requirements of the British public, particular care being taken in showing British Colonies and Dependencies in great detail.

It is not difficult to foresee the time, if its present growth continue, when that indispensable handbook *Who's Who* (A. and C. Black 7s. 6d. net), will appear in several volumes. The new edition for 1905 is more bulky than ever, containing 1796 pages of closely printed biographies. So great a size has the book become that the original nucleus of "Who's Who" is now published in a separate volume called *The Who's Who Year-Book* (1s. net). This contains all those tables of reference which are found so useful to seekers after information concerning those in authority both in Great Britain and the Colonies. The well-known *Englishwoman's Year-Book*, also published by Messrs. Black (2s. 6d. net) is full of interesting information concerning the world of women's work for the current year. It is noteworthy that a well-known chronicle like *Debrett's Peerage, Baronetage, and Knightage* (Dean, 31s. 6d. net) should grow so markedly. If one would refer to an old edition of Debrett of the eighteenth and early nineteenth centuries, its few and sparsely printed leaves make strange comparison with the 2336 closely packed pages appearing in the fourth year of the reign of Edward VII. The new *Debrett* is remarkable for its very artistic illustration of coats-of-arms, many of which appear for the first time.

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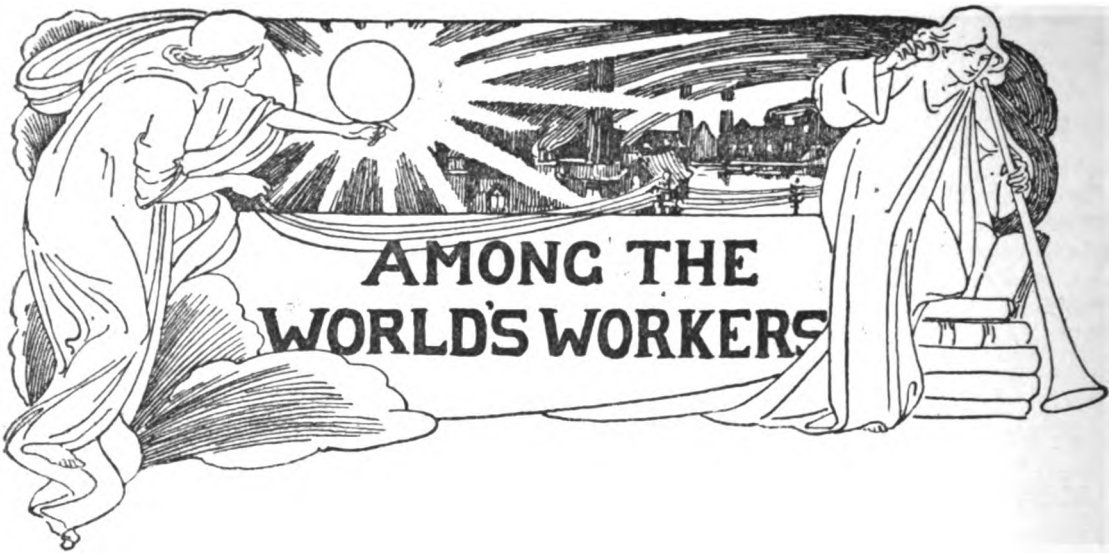

AUTOMOBILE OBSERVATORIES

IN an article in *La Nature*, M. Touchet tells us that automobiles are now being used by astronomers, and he speaks of the new vehicles as "automobile observatories." It appears that they are being fitted up with all the accessories necessary for astronomers who wish to make a special study of shooting stars.

Balloons have been tried for the observation of these stars, but the results obtained are not very satisfactory, and it is believed that the automobiles are destined to render very great services.

In 1903 experiments were made by French astronomers who wished to study the Leonides. MM. Maurice Farman and H. Chretien went by automobile to Anthon-la-Plaine, leaving M. Touchet in the observatory at Chevreuse. Since then great improvements have been made in the vehicles themselves and in the means of transporting the accessories.

STEAM AUTOMOBILES ON RAILS

THE Hanover Railway Company are making trial trips from Hanover to Soltau with steam automobiles. The third-class carriages can take thirty-three passengers; the second class have seven seats, and there are also seven standing places. There is no locomotive for driving these cars, but machinery in the carriage, which can be driven by one man. If these trial trips should prove satisfactory the scheme will be tried on a larger scale.

SIXTEEN HUNDRED CHILDREN BURNED

AT an inquest recently at St. Pancras on a child who had died from the effects of burns, Dr. Thomas, the coroner, once more insisted upon the necessity for fireguards. In the course of two years, he said, over 1600 children had been fatally burned, and although the police had issued an appeal to parents to use fireguards, still the cases continued.

FOR CARRYING AN UMBRELLA

A VERY ingenious device for carrying an umbrella has just made its appearance in Paris. It consists of two small springs which fit round any umbrella handle. A short chain with guard is fastened to this spring, and the guard is then worn in the button-hole of the coat.

NOVEL CHARITY IN DENMARK

FOUR millions of special postage stamps were issued in Copenhagen to be used as a voluntary supplement by people sending Christmas letters and cards. The sum realised by this scheme is to be devoted to charitable purposes.

A NEW VEGETABLE

A NEW vegetable has been introduced into France by M. Labergerie, and M. G. Bonnier has reported on it to the Academy of Science. It is a species of wild potato which grows where there is plenty of moisture, while the ordinary potato does better in dry soil. The plant is a native of Uruguay, and the species which M. Labergerie is cultivating is known as the *Solanum Commetani*, and will yield more than 90,000 lbs. an acre—on ground which suits it.

THE TELAUTOGRAPH

THE French Postal Administration is now experimenting with the Telautograph invented by MM. Isaac and Membret. The message is written down with an ordinary pencil, and there is a roll of paper for the reception

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of messages. These are reproduced exactly as they are written when sent. The advantage of the system is that during the absence of the person in charge of the receiving office, the message is written automatically.

A TELEGRAPHIC TYPEWRITER

THE telegraphic typewriter is an American apparatus invented by Mr. Barclay. The idea is very much the same as in the telautograph, but the message is written on a typewriting machine, and reproduced on another at its destination. The great advantage of this system is that the punctuation and every other detail can be reproduced exactly and at a quicker rate than by the Morse system of telegraphy.

ELECTRICITY ON A LONDON SUBURBAN LINE

THE London, Brighton, and South Coast Railway have decided to work one of their suburban services—Victoria to Peckham Rye—by electric power instead of steam. The overhead trolley system is to be adopted, and single-phase current.

THE LONGEST SPAN BRIDGE IN THE WORLD

THIS title will belong to the cantilever bridge which is now being constructed across the St. Lawrence at Quebec. There are two approach spans of 210 ft. each, two shore arms, each 500 ft. in length, and a great central span, 1800 ft. in length. The total length of the bridge is 4220 ft., and although the Forth Bridge is longer (being about a mile altogether) the new St. Lawrence bridge has the distinction of having the longest span in the world by 90 ft., the two cantilevers of the Forth Bridge being each 1710 ft. in length. The total width of the floor of the new structure is 80 ft., and provision is made for a double-track railway, two roadways for vehicles, and two sidewalks. The main posts are 325 ft. in length, and weigh 750 tons each.

A LARGE BRITISH CONTRACT IN JAPAN

A SPECIAL train consisting of forty-two waggons left Messrs. Dick, Kerr and Company's Preston works the other day, carrying 250 tons of electrical machinery for shipment to Japan, being the complete equipment of the Tokyo Denki Tetsudo Kabushiki Company's tramways. This tramway system when finished will cover over sixty miles of line, and operate some 250 cars, and the complete installation is being carried out by Messrs. Dick, Kerr and Company under the supervision of a staff of their engineers. The only effect the war has had on the progress of the work is in connection with the transportation of the machinery from Yokohama to Tokyo, the railway being congested with war material.

COPPER SULPHATE AS A DISINFECTANT

IT has been suggested in *La Revue* that experiments should be made in Paris with the discovery of Dr. Moore as regards disinfection, sterilisation, and the destruction of bacteria by means of copper. He has proved by his experiments that copper is the best possible preventive against typhoid fever, cholera, and all epidemics. Instead of constructing reservoirs and going to enormous expense in order to filter contaminated water, he maintains that it suffices to put a small quantity of copper sulphate (generally known as blue vitriol) into the most putrid water, and that by continuing this for about three days the water becomes perfectly pure. It appears that in Kentucky this has been tried with great success. In Indianopolis when the cholera raged the authorities had the streets and interior of the houses washed with solutions of copper sulphate, and the result was satisfactory. It is affirmed that it has no injurious effect on the human being, but that on the contrary it is a preservative against all diseases caused by bacteria. In some of the most unhealthy parts of China it is believed that the inhabitants are saved from cholera through having their cisterns lined with copper.

VACUUM CLEANING OF RAILWAY CARRIAGES

THE German Government has just put up a station at Grunewald, near Berlin, for cleaning railway carriages by the new vacuum system. Hitherto the compartments have been cleaned in the old way, the cushions and curtains shaken and brushed so that the dust, which is now recognised as most injurious, was only removed from one place to another. The new German station has been constructed in the most economical way possible, and the railway carriages are taken to it as they require cleaning. Flexible pipes are put into the compartments from the station, and a large number can work at the same time. There is a powerful Booth pump at work, together with ordinary filters for retaining the dust drawn in by suction. The pump is worked by an electric motor of 14 h.p. Six suction pipes are emptied into each filter. Thanks to this installation, one man can thoroughly clean a compartment in less than twenty minutes, so that with several men employed a whole train is quickly disposed of.

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OUR GROWING TRADE WITH EGYPT

THE remarkable expansion of Egyptian trade finds expression in a further large expenditure upon the Port of Alexandria. The Board of Trade call attention to the Egyptian Budget for 1905, in which the Port figures for a sum of £E158,000, although within the last four years considerably over £E500,000 has been spent on it. But such has been the rapidity with which trade has increased that even this heavy expenditure has proved inadequate to keep pace with the requirements of commerce. Egyptian land and securities of all kinds have been rapidly increasing in value of late, and the money set free by the agreement with France will add at once to Egyptian prosperity and to British trade.

The Suakin-Atbara Railway has been energetically pushed on during the year, and will, it is hoped, be completed early in 1906. A sum of £E150,000 is set apart for the creation of a maritime terminus for the railway at Sheikh el Barghout, a place some thirty miles to the north of Suakin. The new port, the official name of which has not yet been decided on, has the immense advantage over Suakin of possessing a commodious harbour, easily accessible to ships of heavy draught.

British exporters not yet in touch with Egypt should immediately take steps, as the *Daily News* advises, to push their trade in this valuable and rapidly expanding market. They will do well, in the first place, to communicate with the British Chamber of Commerce at Alexandria.

FLOURISHING FIJI

THE report upon Fiji for the year 1903 is somewhat late in appearing, but it is a good one. Writing to the Colonial Secretary under date of September 10, 1904, Acting-Governor Major still says there is every indication of future improvement. The revenue for the year 1903 was the highest on record, and totalled £138,166 16*s.* 11*d.*, being £13,228 19*s.* 4*d.* in excess of the expenditure. The total trade of the Colony was valued at £1,043,802, the largest item in the export trade being sugar, £406,318. "Now that the Colonial Sugar Refining Company have commenced crushing operations at their new mill at Lautoka, and are putting additional areas under cane at their other centres, the export of sugar is likely to be much larger in future years; and it is noteworthy that the Company has acquired refining works at Vancouver to which port sugar is now being shipped from Fiji.

"A very desirable class of European planter is now settling in the Colony, and turning attention to the cultivation of cocoa, spices, and other products, which have hitherto figured in the export list as very minor exports, if they have appeared at all. Every assistance is being given to encourage such settlement, and to the introduction of cotton planting, which is likely to be taken up again in this Colony. A representative of the British Cotton Growing Association is at present on a visit to Fiji, and, as the outcome of negotiations between the Government and the Association, it is probable that some 6000 acres of land will be immediately planted, and that ginning machinery will be sent out to the Colony by the Association."

It is added that the cultivation of tobacco and the establishment of a factory at Suva by a firm of manufacturers have, unfortunately, not been successful, and all operations have been stopped.

THE NEW PATENTS ACT

THE Patents Act which came into force on January 1, effects important changes interesting to inventors. Hitherto, when an applicant deposited his complete specification the Patent Office only examined it to see that it was formally correct. Under the new system, however, all applications for letters patent for inventions will be examined by the Comptroller of the Patent Office and a special staff, with the object of finding out whether they are practically or probably anticipated by any patents issued during the preceding fifty years. If the result of the examination is unsatisfactory, the examiner will report to the Comptroller the number and dates of patents in which he thinks the applicant's invention has been wholly or partly described, and will suggest amendments. If the applicant then insists on maintaining his specification unmodified, the Comptroller has no power to refuse to issue the letters patent, but he may inform and protect the public by drawing attention in the letters patent to the anticipations tending to invalidate the immediate grant. Another alteration upon the present system is that no specification dating back more than fifty years shall be held to be an anticipation in itself.

The new Act is expected to have a stimulating effect upon inventions in Great Britain—though so excellent an authority as Sir Lloyd Wise believes that the new rules need modification in certain particulars. Many applicants who have hitherto been prevented owing to the agents' fees from taking out a patent will now themselves send in their specifications; and the staff of the Patent Office has been increased in view of the new duties. The granting of worthless patents will be curtailed, and the search which has to be made under the Act will prevent manufacturers being deceived by taking up an old article from an inventor who thinks it is new.

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HOW A YOUNG MAN PAID HIS FATHER'S DEBTS

IN a recent newspaper paragraph it was stated that in the Hull Bankruptcy Court a gentleman accounted for his deficiency by the amount expended on the education of his family. This led an Edinburgh correspondent to relate the following in the *Times* of January 2: "If the members of this Hull family follow the example just set them by the son of an Edinburgh lady, their father's creditors may still look forward to receiving payment in full. This lady's husband, a native of another land, conducted successfully for a number of years a boarding and day school for girls in the northern district of Edinburgh, but the tide turned, and on his death, after a long illness, she was left entirely without means and a family of four, whose education had still to be completed. Leaving everything for realisation by an agent, for the benefit of the creditors, she removed to London, and having some earning capabilities she was enabled to complete unaided her children's education. She had succeeded in inbuing her eldest son with a determination to remove the stain of undischarged liabilities from his father's memory, and on receiving an appointment in South Africa, in connection with the scientific side of gold mining, he resolutely set himself to accumulate the considerable sum necessary to achieve his own and his mother's set purpose and desire. By much hard work and self-denial he was this month able, through a relative in the city, to hand cheques to the creditors for the full amount of their claims against his father, and to have the receipts posted to London as a birthday present to his mother."

HEATING FOOD WITHOUT A FIRE

AT various recent food exhibitions there has been on show an invention for heating food without fire and without the usual troublesome accessories of pots and pans. An innocent-looking tomato soup tin has four holes punched at one end, and immediately that is done, the whole thing begins to fizz and boil. It is left for five minutes until the heating materials evaporate, turned upside down, and left for another five minutes; then it is opened in the ordinary way, when thoroughly cooked soup can be poured out. Its name is Calorit, and the food, which is prepared by some well-known firms, is of the first quality. About a dozen varieties of soup can be had, and the same number of entrées, besides coffee, cocoa, and chocolate.

It is a great find for the motorist on a tour for business or camping for pleasure. Room has to be found in the car for the required number of tins of the usual tinned food size, and after a meal, of course, the used tins can be thrown away. A hundred other instances immediately suggest themselves in which such an invention would be invaluable—as an emergency ration for the soldier on the field, while reconnoitring, on outpost duty, or in bivouac; as a means of provision for the aeronaut, the sportsman, the yachtsman, the sailor and the explorer, for a solitary occupant of a city flat who has grown weary of restaurant meals, as an ally of the housewife when cook is ill or non-existent. It might even be adopted by the patient member of a "first-night" theatre queue, or the adventurous loyalist who waits long hours in the hope of viewing some imperial procession. And the wonder of it is that no one has forestalled the ingenious American discoverer, for the secret of the process is that cold water poured on lime brings it to boiling-point.

THE CHESTNUT AS FOOD

THE street potato and the street chestnut have been coming in for praise at the hands of so good an authority as the *Lancet*.

In what club, restaurant, hotel, or home, it asks, can be found potatoes so admirably cooked as those in the street potato-can? Or what chestnut is more appetisingly cooked than that which is grilled *al fresco* on the hot tea-tray? The potato-can man and the chestnut man are distinct benefactors, at least to a certain section of the public, for they provide cheap, good, and excellently cooked food to the cold and hungry man which at the same time comforts and warms. It is an interesting fact that the potato and the chestnut have been picked out as practically the only foods offered for sale in this way, and on reflection we can see that, after all, this choice is based on sound dietetics. According to an analysis of the raw chestnut and potato their composition is as follows:

	Chestnut. Per Cent.		Potato. Per Cent.
Water . . .	53.640	..	76.700
Proteid . . .	3.710	..	1.200
Mineral matter .	0.870	..	0.900
Fat	2,160	..	0.100
Starch . . .	31.790	..	19.100
Sugar and Gum .	6.100	..	1.400
Fibre . . .	1.730	..	0.600

The chestnut is, therefore, more nutritious than the potato: moreover, it is the most digestible of nuts. The man with the chestnuts on his red-hot tea-tray conveys a lesson which might, the *Lancet* thinks, be taken more seriously to heart.

NOVEL EXPERIMENT IN SMALL HOLDINGS

IT is reported in the *Times* that a considerable number of agricultural labourers and small tradesmen have just been handed their title-deeds of small freeholds which have been acquired by them free of all incumbrance in the following

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circumstances: Ten years ago, when Mr. A. B. Markham, M.P., was occupying Baggrave Hall for the hunting season, he conceived a plan for enabling a number of the inhabitants of the village of Twyford, in Leicestershire, to become freehold owners of small holdings. He purchased about sixty acres of suitable land at £30 per acre, making a total of £1800. To this was added interest at the rate of 4 per cent., which amounted to £450, bringing up the purchase price to £2250, or equal to £37 10s. per acre, to be redeemed in ten years. This sum, divided into ten annual payments, worked out at £3 15s. per acre per annum. The object was to carry out the scheme on purely business lines. The purchasers under this scheme were strictly restricted to agricultural labourers, tenant-farmers, or small shopkeepers in the village. No power was given to the buyers, until they became owners of the freehold, to let or mortgage their holdings, but they had the right not only to occupy the land, but to erect buildings or dwelling-houses save and except any for the sale of intoxicating liquors. Under this scheme a labourer by paying fourpence per week had an allotment of 1000 yards of land, and at the end of ten years it became his own freehold without further payment. The scheme worked out perfectly, and just before Christmas there was great rejoicing in the village on the occasion of the handing over of the title-deeds to the villagers. During the time they have been paying for the land they have paid less than is generally paid for rent alone, and at the same time they were paying off both principal and interest. The new freeholders celebrated the completion of the scheme by a dinner at the village hotel.

TRIUMPHS OF WIRELESS TELEGRAPHY

A TELEGRAM by wireless telegraphy has been transmitted by Mr. Marconi from the Marconi Company's station at Poldhu, Cornwall, to a station belonging to the Italian Government at Ancona, Italy. The message was addressed to the Admiral Mirabello, Italian Minister of Marine, to whom Mr. Marconi sent his greetings, and informed the admiral that he purposed paying him a visit towards the end of next month. Admiral Mirabello replied, thanking Mr. Marconi for his wireless message, which he said had been duly received at the Ancona station, and added that he would be very glad to see him again so soon in Italy.

The station at Ancona is a small station, not originally intended for long-distance work. The distance between Poldhu and Ancona, about 1000 miles, is almost entirely overland, and in order to reach their destination the waves had to pass over nearly the whole of France and a considerable part of Italy, including some of the highest mountains of the Alps.

On a recent voyage from New York to Queenstown, the mail steamer *Campania* beat all previous records in wireless telegraphy at sea. During the quick passage of five days eighteen hours, wireless communication was established with no fewer than twelve Transatlantic liners, ten of which were bound to American ports and two to British ports. Messages were received from and sent to each of these boats. At 4 A.M., on the Tuesday, when the *Campania* was 1200 miles from New York, wireless communication was established with the *Saxonia* and *Ivernia*, the former from Liverpool to Boston, and the latter from Boston to Liverpool. The three Cunarders continued in communication at the same time for several hours, all the latest news from England and America being sent by the *Campania* to the Boston steamers. When the ships of the White Star Line are fitted with the system practically every Atlantic liner will have wireless communication.

The first returns of the new working arrangement between the Marconi Company and the British Post Office show that the public are availing themselves to a large extent of the services of wireless telegraphy.

INDOOR RIFLE SHOOTING

THE Council of the Society of Miniature Rifle Clubs, of which the Duke of Norfolk is Chairman, has devoted itself for the last three years to promoting the class of rifle shooting termed "Miniature," knowing its great utility as a popular teacher of the elementary side of the art of rifle shooting, and also the very small cost at which such knowledge can be gained. Over two hundred Rifle Clubs, formed in London and many parts of England and Wales, in schoolhouses and playgrounds, &c., are now on the books of the Society; and the Duke of Norfolk appeals to generous people to help on the movement by endowing more of these institutions. Any one wishing to obtain information and advice about this class of rifle shooting should write to the Secretary, at the office of the Society, 20 Bucklersbury, Queen Victoria Street, E.C., and can also obtain through him at the lowest prices all kinds of apparatus, targets, rifles, ammunition, &c., most appropriate for carrying on the game

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RAILWAY SIGNALLING DURING FOG

AS every one has experienced the delay which occurs on a railway journey in foggy weather, so every one should be closely interested in hearing of an apparatus which competent authorities believe will lead, if adopted on our railways, to an increase of safety and a decrease of delay in the working of the lines when fog prevails. The device was described by a special correspondent in a recent issue of the *Times*. It is the invention of Mr. Wynford Brierley, a Lancashire man now living in London. It has been tried, with satisfactory results, on the Great Northern; it has been favourably considered by the railway authorities of several continental powers; and Lieutenant-Colonel Yorke, R.E., Chief Inspecting Officer of Railways for the Board of Trade, has subjected it to a thorough examination and trial. He permits Mr. Brierley to quote the following letter: "I was pleased with what I saw of your apparatus on the Great Northern Railway, and I believe that under many circumstances it may prove to be a valuable auxiliary in railway working. I wish you success in your endeavour to secure the adoption of your appliance by the railway companies of the United Kingdom.—H. A. YORKE."

The correspondent explains the working of the apparatus as follows: A train is supposed to be proceeding from A to B in a dense fog, and there is a signal-box half-way between the two points, from which box it is assumed (merely to save needless detail of description) that a single semaphore signal-post is worked. The first part of Mr. Brierley's invention consists in placing alongside the metals, but clear of the wheels, a block of iron called the "rocker," connected with the wire that operates the semaphore in such fashion that when the signal "danger" is made on the semaphore the "rocker" is in one definite position, and when the signal "all right" is made the "rocker" is in another definite position. In other words, working the semaphore works the "rocker" also, and the signalman has no extra trouble or responsibility. This part of the apparatus is placed substantially nearer to the point A than the ordinary semaphore signal, so as to avoid the danger of overrunning the signal. To the engine is affixed a trigger, which will impinge on the "rocker" when it is at "danger," or two triggers are affixed, one to catch "danger" and one to catch "all right," if that be desired. The triggers operate a mechanism, electrical or a clock-work bell, or what you will, that repeats in the cab of the engine the signal that is already made, and invisible, on the semaphore. Supposing this to be "danger" the train is stopped before it comes to the signal proper, or as soon as it would have been stopped if the air were clear, and nothing is easier after that than to arrange a code of signals, by whistle, or electric bell, enabling the signalman to tell the engine driver when to proceed.

Many inventors besides Mr. Brierley have advanced to this stage; but this is the point at which most of them break down, and at which competent engineers believe that Mr. Brierley has achieved a greater measure of success than any other inventor. This I myself (says the correspondent) heard from the lips of one of the best-known of railway engineers before I had met Mr. Brierley; but the engineer, knowing perhaps how infinitely tiresome inventors are prone to be, earnestly desires not to be mentioned by name. If he were, he would probably be beset by some dozens of other inventors within twenty-four hours. It must be taken, therefore, on my authority, that this railway engineer of established position having seen the apparatus and having made practical trial of it, believes that Mr. Brierley's device excels all others in strength and indestructibility. This result is secured by an ingenious arrangement of double-coiled springs, with the coils in reversed order to each other, in the "rocker" and at the base of the trigger, so that each, after being displaced, returns automatically to its original position. The springs on which the "rocker" works are far the stronger of the two; if they were not the "rocker" would not work the trigger; at the same time they are not so strong but that the "rocker" would yield to a rigid impact, such as that of a snow-plough or a hanging waggon door, and resume its position afterwards. On the other hand, the springs on which the trigger works yield easily to a touch of the finger.

The apparatus is simple, very strong, inexpensive, and it meets a need severely felt at all times, and more than commonly pressing in these days of fog and mist. Its details are immaterial to the main argument. It does not matter whether a bell be rung, or a miniature signal shown in the cab of the engine; it does not matter much, perhaps, whether it be arranged for a positive and for a negative signal (Colonel Yorke prefers both) or for one of them only. The essential point is that it enables the signalman to transmit to the moving engine the same signal that is shown by the invisible semaphore, and that it produces this result with the least possible risk of failure. This freedom from the risk of failure, in its turn, is due to the double-coiled spring with coils in reversed order, which distributes the force of the tremendous blow given by a trigger dependent from an engine travelling at fifty or sixty miles an hour.

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THE FINEST BUSINESS SITE IN THE WORLD

AND THE OPERATIONS OF A GREAT INSURANCE COMPANY

REGARDING London as the centre of the commercial universe and the region around the Bank of England as the centre of that centre, it is no stretch of the imagination to refer to the commanding position occupied by the new London Offices of The Liverpool and London and Globe Insurance Company as the finest business site in the world. The situation is unique, and the building erected upon it is one of the best examples of business architecture that the metropolis, with all its recent improvements in that direction, can boast. How important the position is may best be realised by looking out from the office windows upon the many avenues of traffic which branch from this famous conveying point.

The building itself, which is of Portland stone and four storeys high, is the terminating point of both Cornhill and Lombard Street, filling the space between the two thoroughfares with an even circular frontage, the lines of which are at once harmonious and impressive. Northward it overlooks the Royal Exchange and the Bank of England, Threadneedle Street, and Princes Street; to the south is King William Street; and the full-front westward view reveals the Mansion House and the great open space it faces, and beyond, the life and movement of Cheapside and Queen Victoria Street show clearly.

From a business point of view, therefore, these new offices of The Liverpool and London and Globe Insurance Company could not be surpassed; and, from an architectural point of view it will be generally admitted they are worthy of the site. The circular treatment of the front has doubtless involved architectural difficulties, but the result is decidedly imposing, and shows that the difficulties have been successfully surmounted. A four-square building would have been a simpler proposition, but the result would have been far less satisfactory. Both outside and inside the circular idea dominates, and the dome with which the structure is crowned adds greatly to the beauty of the design.

The general office on the ground floor, which is entered from the Cornhill side, is remarkable not only for its size but for its artistic and dignified arrangement. The counter of solid mahogany is in the form of a semi-circle, approached from a wide open vestibule, on the inner side of the building, and the rows of desks behind the counter extend forward towards the great arched windows of the circular front. The arrangement is roomy, businesslike, and convenient both for customers and for officials. It is altogether one of the handsomest general offices in London, light, lofty, and comfortable. There is a gallery on the Mezzanine floor above, supported by massive fluted columns of Italian marble, and the same style of treatment is continued upward to the dome, which, with its enrichments and beautiful light inlets will be much admired. The whole of the offices, corridors, and staircases are finished in marble, with mosaic floors and walls covered with an elegant faïence. Each room is of distinct design, both as to walls and ceilings, and the two large board-rooms on the second and third floors are as luxurious and chastely decorative as could be desired.

The new Liverpool and London and Globe Offices will indeed both form an agreeable architectural landmark for the busiest part of London and admirably fulfil the purposes for which they are designed. The architect, Mr. J. Macvicar Anderson, F.R.I.B.A., has shown great skill in the handling of the site and has given us a business structure of a very imposing character. To Messrs. Colls and Sons of Coleman Street, the credit belongs of having carried out the work of construction in all its details with complete success. The marbles have been supplied by Messrs. Burke and Company of Rathbone Place, and include

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THE NEW LONDON OFFICES OF THE LIVERPOOL AND LONDON AND GLOBE INSURANCE COMPANY

AT THE CORNER OF CORNHILL AND LOMBARD STREET, IN THE HEART OF BUSINESS LONDON

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specimens of the choicest Italian kinds as well as some from America. The Burmantofts Company are responsible for the beautiful faïence furnishings, which are exceedingly artistic and eminently suitable for this special decorative purpose. The arrangements for electric lighting and for heating are of the most efficient description, and the structure is as fire-proof as any building could be made. Notwithstanding this there is full provision for dealing with any sudden outbreak, which is making assurance doubly sure, and highly commendable in the case of a company whose chief reason for existence is to give protection from loss from fire.

The building is one that will strike the eye as the most noticeable of the buildings in its neighbourhood. Its boldly outlined front, with Ionic half-columns flanking its spacious higher windows, and the massive and dignified treatment given to the lower portion, present an architectural *tout ensemble* which adds a grace and a beauty to this projecting corner of the heart of London that it has never before possessed.

To trace briefly how this result has been arrived at—how it happens that this erection commemorates a great achievement in the history of insurance—will be an interesting task.

The Liverpool and London and Globe Insurance Company, with an active history of nearly seventy years to its credit, is one of the few companies of which everybody knows, for its operations are not only great in bulk but of far-spreading extent. It originated in Liverpool in 1836, as a natural outcome of that city's rapid commercial expansion. Liverpool, with its immense and ever-growing commerce with foreign lands, was attracting to itself enterprises of great magnitude, and the time seemed ripe for the formation of a strong Insurance Company, whose headquarters should be in Liverpool. The project was favourably regarded by many of the leading men of the city, and on May 21, 1836, the Deed of Settlement was executed by which the Liverpool Insurance Company, as it was then called, was formally and legally established. In the following July an Act of Parliament was passed for carrying into effect the objects of the Company, and the undertaking was launched amid general approval and with a prospect of success which time has fully confirmed. It is worthy of remark that some of the earliest proprietors of the Company were prominent Liverpool commercial men, and bore names which have been familiar in mercantile circles there for many generations. One of those proprietors, Sir Thomas Brocklebank, Bart., is still living.

At first the Company's operations were confined to home business—that is, business within the United Kingdom. But as each year saw the position of the undertaking strengthened, it was eventually decided to extend the Company's borderland, and open up connection with foreign countries. This important step was taken after mature deliberation, and with a full knowledge of what it implied and the new responsibilities it entailed. But it proved a step in the right direction, and led to a foreign business on a then unprecedented scale, inaugurating the world-wide extension which was afterwards realised. By the adoption of this policy the Company gradually came to have offices and local acting boards of directors not only in various cities and centres in the British colonies, but on the Continent of Europe and in America—in Paris, Hamburg, New York, Chicago, San Francisco, New Orleans, Montreal, Sydney, and Melbourne; while in most of the leading cities of the United Kingdom special offices were opened. The enormous amount of work entailed by these great extensions was met by a completeness of organisation that represented thorough business efficiency and foresight, and not the least important feature of these new extensions was the high character of the branch boards that were established, ensuring local knowledge as well as local influence. The result was from every point of view beneficial to the Company and to its insurers. Its resources were increased and its position strengthened.

In 1847 the Liverpool Insurance Company acquired the business of the London Edinburgh and Dublin Life Assurance Company, and applied to Parliament for permission to change its name to the "Liverpool and London," which was granted. This acquisition made it necessary to open a London office, which meant a new and important operating centre. Meanwhile, the business was solidly extending, and, in 1864, the Company was still further strengthened by the taking over of the Globe Insurance Company of London, calling for another alteration of title, so that it then became what it still remains, The Liverpool and London and Globe. By the last-named amalgamation, it is interesting to note at this juncture, how the London office, which occupied the site of the new building we have described, was acquired.

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The chief office, however, has always remained in Liverpool, where the Company was originated.

The first Secretary, or chief executive officer, of the Company, was Mr. Swinton Boult, who continued his connection with it down to his retirement in February 1873, when he was succeeded by Mr. Henry Thomson, who, however, only occupied the position for a brief period, his death occurring in December 1875. Immediately afterwards, Mr. John Matthew Dove, the present General Manager, who was at that time Assistant Secretary, was appointed to succeed Mr. Thomson, and under his able management the Company has made considerable progress and greatly strengthened its position, the Premium Income from the Fire and Life business having risen from £1,283,632 in 1875, to £2,213,275 in 1903, while its funds have increased from £4,799,724 to £10,401,149. Of this amount £7,182,229 consists of the accumulated Life Insurance Funds, and the balance of £3,218,920 represents the paid-up capital (£245,640) and the Reserves accumulated out of Fire Insurance profits during the sixty-seven years of the Company's existence.

There has been no plunging, no attempts at fancy finance, no wild speculation, but just a right and adequate handling of the Company's affairs, with the preservation of an ample fund to fall back upon for emergencies. The Company has, like most of its competitors, had its resources tested by extraordinary demands, consequent on great conflagrations at home and abroad, but it has always been able to bear the strain and emerge in a stronger position than before. The names of these great fires are broadly inscribed in the loss books of Insurance Companies, and are as interesting as they are instructive to read, for many companies have had to go under owing to the severity of their losses at such disastrous periods. With The Liverpool and London and Globe it has been different.

Undoubtedly the severest ordeal it has had to go through was on the occasion of the historic fire at Chicago, which broke out on October 8, 1871, and destroyed property covering 2124 acres, valued at upwards of £30,000,000. Such a fire had never before been known since insurance companies had existed. The appalling disaster involved the fire companies in such enormous losses that there was great anxiety to know how they would be able to cope with the event, and what proportion of their losses they would be likely to pay. As far as The Liverpool and London and Globe was concerned suspense was soon set at rest, and it was an intense relief to the Chicago sufferers who were insured with this Company that on October 16, within eight days of the breaking out of the fire, a cablegram was received from the head office in Liverpool in the following words: "*Draw as required up to two million dollars. If any advantage in bank credit cable us.*" The question was solved. Difficulty, there had been none. Whatever companies were unable to meet their full obligations in connection with the Chicago Fire. The Liverpool and London and Globe was not one of them, but ultimately paid over £650,000 for its adjusted Chicago losses. This prompt payment added to the prestige of the Company, placing it in the very strong and sound position it has ever since held in the United States.

Perhaps the next largest fire that the Company has been confronted with was that which took place in Boston the year after the Chicago Fire, involving a loss of nearly £300,000 to The Liverpool and London and Globe, making a total American loss in about a twelve-month of nearly a million sterling.

The following figures will serve to illustrate the progress of the Company both in its Fire and Life operations, from 1836 to the present time:

Year.	Fire and Life Premiums.	Total funds at close of year.
1836 . .	10,851 ..	
1846 . .	63,929 ..	125,901
1856 . .	295,060 ..	820,374
1866 . .	1,072,452 ..	3,254,335
1876 . .	1,227,412 ..	5,152,530
1886 . .	1,515,165 ..	7,324,035
1896 . .	1,783,161 ..	9,328,708
1903 . .	2,313,275 ..	10,401,149

Such a record affords a gratifying practical testimony to the soundness, stability, and wise direction which a great British Insurance Company stands for. The Liverpool and London and Globe has been built on a sure foundation. Starting with high business aims and a clear conception of its proper sphere of operation, it progressed from year to year—sometimes rapidly, sometimes slowly, according to the changing conditions of trade and other circumstances—but advancing always; and as its affairs stand to-day, this old and important Company offers insurers as complete a guarantee of strength and capacity as could well be given. With funds reaching the large total of considerably over ten millions sterling, and an able and adaptable organisation, enabling it to do business on the most favourable terms, it offers insurers every safeguard and guarantee that could be desired or is attainable.

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THE MAKING OF A MOTOR-CAR

THE NEW ROLLS-ROYCE CAR

MOST people have watches, but very few people are acquainted with the details of their manufacture. Many people have motors, many more are contemplating buying them, but few are aware of the processes by which a motor is built up. It may be of interest, therefore, if we devote this article to a short description of the manufacture of a motor-car from its inception until the moment at which the purchaser takes possession of the completed machine; and as the Rolls-Royce car is the latest all-British car to be placed on the market, the present article will deal mainly with the various phases of the manufacture of this car, which, as most readers of motor literature will know, attracted wide attention and marked approval at the Automobile *salon* in Paris last December.

The Rolls-Royce car not only claims notice as being of home manufacture, but because of its special features and improvements. The car has indeed called forth a general chorus of praise from the motor experts of the various English journals who have had the opportunity of testing its capabilities. The *Times* representative wrote that "one could neither hear nor feel the engine," that "wayfarers never seemed to hear it as it approached them, and that it would turn in a remarkably small circle." The *Daily Telegraph* referred to the "flexibility and silence" of the car, and to the fact of its being "easily managed" and "exceedingly gentle." *Country Life* spoke of its "extraordinary silence and smoothness"; and the *Pall Mall Gazette* regarded it as the "perfection of motor motion."

The Rolls-Royce car—the "R.-R.," as it is popularly styled—is manufactured for Messrs. C. S. Rolls and Company of Conduit Street, by Messrs. Royce, Ltd., of Hulme, Manchester, who have long been famed for their electric dynamos, and whose electric cranes are to be seen in most of the leading engineering shops in the kingdom. The association thus formed seems to have been an altogether happy one; the Hon. C. S. Rolls and Mr. Claude Johnson represent the practical side of motoring and all that it involves, and Messrs. Royce possess in the fullest degree the mechanical knowledge and equipment necessary for motor-car production. Mr. Royce was primarily responsible for the design of the Rolls-Royce car, but in the design are incorporated those features of the best-known Continental cars which Mr. Rolls specified should be employed. Mr. Rolls' decision as to the best design of motor-car

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is the fruit of the unique experience which he has had since 1895 with the most approved touring and racing cars, he having competed in nearly all the big races, won numerous prizes, and holding the gold medal for the most meritorious performance in the Thousand Miles Trial of 1900. The style of car having thus been agreed upon between Mr. Rolls and Mr. Royce, down to the minutest detail, the manufacture was proceeded with, and large numbers are now being turned out.

It is to the production of the car that we now propose to direct attention, and for this purpose we have to visit the works of Messrs. Royce, Ltd., which are situated at Hulme, Manchester, and cover five acres of ground. The scene and its surroundings are alive with industrial life and activity, and the hum and clatter of machinery, the roar and blaze of many furnaces, and a maze of towering chimneys show that manufacturing operations on a vast scale are in progress. It is only when confronted by such a mass of mechanism, as can be seen in a gigantic factory of this description, that one begins to realise what a multitude of details and operations go to the making of a motor.

Before even the initial stage of manufacture can be entered upon an immense deal has to be done. Apart from the fact that a very special equipment is necessary, involving a large outlay, when, as in the present instance, it has been decided to make a car that shall be the most perfect of its size, and of the highest quality, and yet in a sufficient variety to meet all ordinary requirements, each separate mechanical item has to be considered both as a distinct part and in its relation to the whole. Thus, in turn the style and size of the engines have to be decided upon, the form of ignition, the system of transmission, the change gear, the steering, the axles, and other parts, each being susceptible of almost endless variation and modification, according to circumstances and demand.

It is in the design and drawing-department of Messrs. Royce's works that these numerous intricacies first arrest our notice. All the parts are drawn in units, to begin with, to the requisite scale, then assembled after separate approval, arranged in their proper positions, and afterwards every detail is again dealt with separately. The amount of close, delicate, and skilled work which all this drawing and re-drawing necessitates is almost beyond the comprehension of the lay mind. Every part will generally require to be drawn many times over before it can be pronounced as exactly fulfilling its requirements, and to bring the parts of the design together so that they will adapt themselves to each other perfectly is a labour of no small difficulty. And indeed the designer is often faced with an arduous problem,

THE PATTERN SHOP

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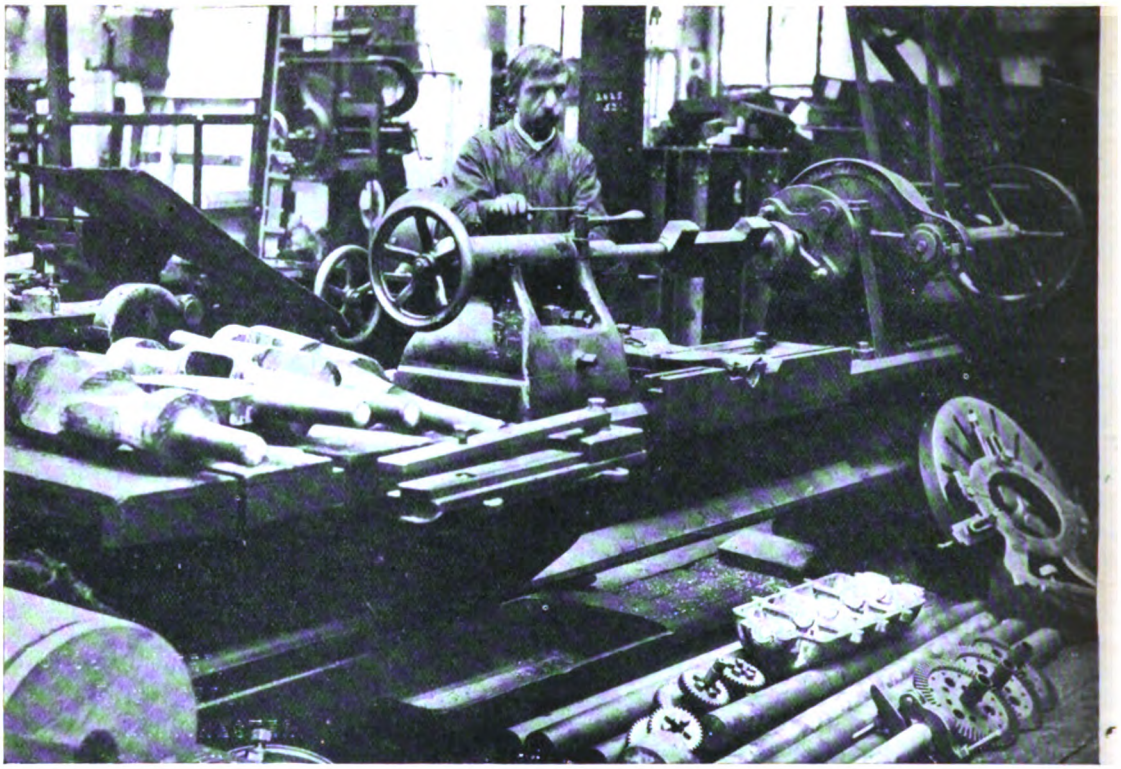

TURNING A CRANK SHAFT

altering here and adapting there, moving this and adding that, anxious to secure all the advantages without having to give up anything, and finally emerging from his task with a success that makes everything look simple, easy, and perfect.

When the drawings have been satisfactorily completed, photographs of all the standard tracings are made, and these are distributed to the various departments, principally to the pattern shop and forge. For the parts that are to be made from castings, wooden patterns or full-sized models have to be constructed, which entails great skill in working, and good judgment as to the best way of moulding the piece, as exact measurements have to be followed, and due allowance made for contraction. It may be that metal patterns will be best to work from in certain cases. This the modeller has to decide. Be that as it may, it will be seen that much careful and important work has to be performed before the actual making of the parts can be proceeded with. The designs and models must be perfect, or there will be no perfect car.

Another special feature has to be considered, moreover, at this point. The weight and strength of the materials to be used must be settled. This is crucial. "Weight" is the never-ending cry that makers have to contend with. In the Rolls-Royce car the right balance between weight and strength has, it is believed, been attained. Messrs. Royce do not build the lightest variety of chassis, but they regard it as of the utmost importance that the strength shall be the greatest possible for a given weight, and consequently they only use the very strongest and toughest of materials. Materials of this character, it may be stated, are generally unweldable, therefore to make assurance doubly sure the strict rule has been made that no such welding shall be allowed in Rolls-Royce cars. The pieces are forged, often from comparatively large ingots, in a powerful hydraulic press.

The next stage after the models have been passed by the drawing-office staff is the foundry. Here we have a very large department, smelling of sand and mould and fire and smoke, and busy with a large number of workers. In general appearance it is not unlike other big foundries, but in so far as the making of the necessary parts for the "R.-R." motor goes it possesses features that are all its own. The sand used is of special selection, the mould and cores are

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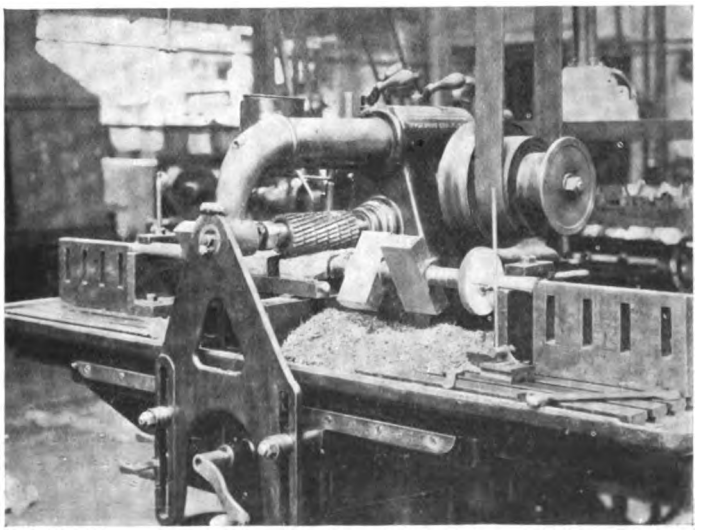
ventilated in a particular way, and generally much more care is displayed in making the castings than is demanded ordinarily. The patterns are placed in the sand, and the required impression is made to enable the moulder to produce the casting. Meanwhile, the metal is being prepared according to the Rolls-Royce formula. The selection and mixing of the suitable metal or metals of an alloy has been made, the melting has been brought to the correct temperature, and when all this is done the molten metal is poured into the moulds at the lowest possible temperature at which it will flow. But the work of the casting-foundry is still far from completed. As some one says, "many dangers environ those who meddle with hot iron." Though the metal is in the mould in the precise quantity needed, it is still possible for the casting to go wrong. If it cools too quickly or too slowly it will not do. It must be just right. Much care has to be exercised in uncovering the mould, to prevent in such metal as aluminium the core from cracking the casting as it cools down and contracts round it before the metal has sufficient strength to compress the core. To obviate this, as much sand as possible is removed from the inside of the casting. Thus a patient watchfulness has to be maintained until at last the casting can be taken up as perfected metal of the form and shape desired.

Having passed this ordeal successfully, the castings are forwarded to the dressing-shop, where their rough edges get trimmed, and all the accumulations of sand, core wires, and cores are removed, the dresser finally cleaning the castings by either acid pickling or sand blasting. By the time the dresser has done with a casting it is spick and span and altogether a gratifying object to such as understand what good, sound metal means.

In the case of the pieces which are forgings, the operations are on a larger scale, and the greatest care has to be exercised to ensure the correct kind of metal—chiefly wrought nickel-steel—being used for the purpose. The forging-shop has ponderous presses and hammers, and furnaces of great power and capacity. The working clamour, the commotion, and the sounds and sights generally are suggestive of mighty operations, and yet the utmost precision of action seems to prevail. There may be some slight confusion in the mind of the spectator who is not of the initiated, but there is none on the part of the workers or the great forces that they direct. Here we see the ingot or bar of metal being heated to the point of red-hot pliancy, then automatically moved to one of the hydraulic presses or great hammers, and there pressed or hammered in to the proper shape for finishing. The finished forging is completed by means of special dies made for the piece, such dies being contained in a drop-hammer—hence the term drop-forging—or, in some cases, the piece is stamped out of wrought sheet-steel or other metal.

Up to this stage, the various parts of the Rolls-Royce motor-car have been scattered, each undergoing its separate preparation and perfecting ready for the time when it would be able to unite with the rest of the parts in one complete, road-equipped car. In the machine-shop—a department of vast extent—all the parts are being turned, or milled, or drilled, or tapped, or screwed, or in some other way made ready for the final fitting together. Both castings and forgings find their way into the machine-shop. Many of the forgings after machining are hardened, or case-hardened, according to requirements, so as to produce an almost glass-smooth coating of steel for the prolonging of their life and to prevent them wearing their bearings. Unfortunately, during this process the parts frequently warp through the great heat necessary to the cementing or



MILLING A CRANK SHAFT

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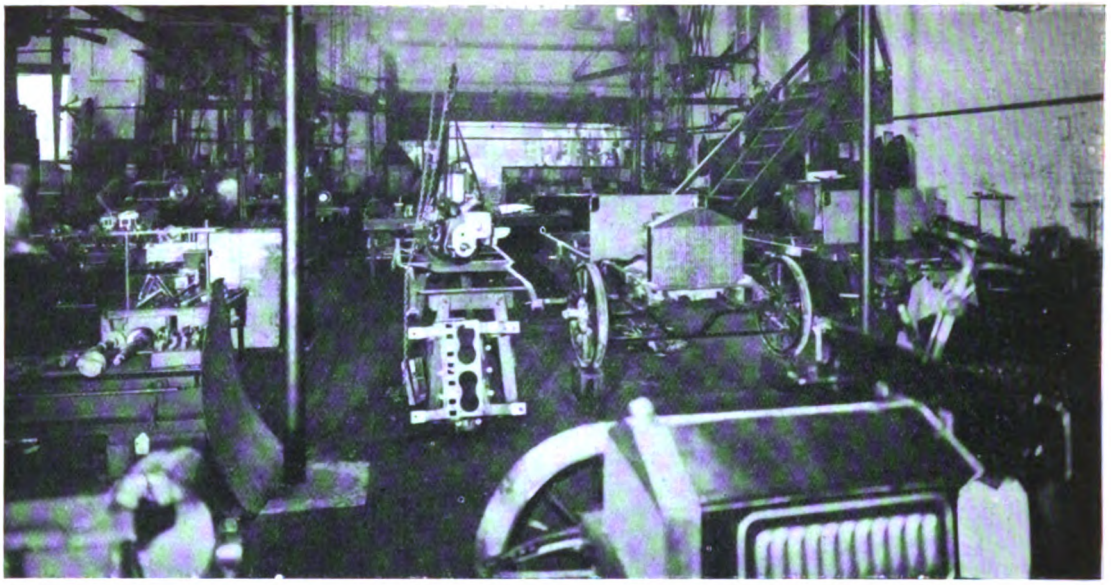

THE ERECTING-SHOP

carbonising process. Then, after the hardening, comes the long and tedious operation of straightening and "truing" the various warped pieces, after which the journals, bearings, and other parts are ground exactly true, round, and to size.

Nor are the separate operations and workings ended here. While in these gigantic Royce workshops, all the metal and machine departments have been contributing their quota to the whole, a multitude of other trades have been equally busy with separate parts. The electrician, the wheel-maker, the tyre-maker, the sheet-metal worker, the spring-smith, the tube-maker, and many other trades and sub-trades have been employed upon their own particular work for the car. The immense volume of work involved may be gathered when it is stated that there are upwards of nine hundred differently designed pieces, many of them multiplied up to dozens of times, in a single car.

In the fitting-shops we seem to be on more familiar ground. There we see the cars in course of erection, some complete and ready for the road, others in various stages of building. All the parts are tested before being put into erection, the engines, gearing, and other special parts being put to the severest test possible. It should be mentioned that the "bodies" of these cars are furnished by Messrs. Barker and Company, the famous London coach-builders to the King and the Prince of Wales, and are of the highest quality ever adopted on motor-cars.

When all is complete, and the car is apparently finished, it has still to undergo the culminating expert test, and to be tried in every conceivable way, for no car is ready for sale until this test has been satisfactorily passed. The Rolls-Royce car is not in any sense an experiment. It was not placed on the market before it had covered fifteen thousand miles and been submitted to every kind of practical test, and the facts that it is becoming one of the chief favourites of the day, that it is all-British, and that it is silent, simple, strong, light, and of thorough reliability, form proof sufficient that there is no need to go abroad for a really high-class car; while in point of economy the Rolls-Royce will compare advantageously with any.

Those who are interested in motor-cars will do well to inspect the "R.-R.," at Messrs. C. S. Rolls and Company's spacious new premises, 14 and 15 Conduit Street, W., which consist of three floors and form one of the most attractive exhibitions of the kind that London can boast. The firm have also large repairing-shops and garage at Lillie Hall, West Brompton. The joint managers of the undertaking are, as already stated, the Hon. C. S. Rolls, M.A., and Mr. Claude Johnson, both motor-car experts of great experience. Mr. Rolls' driving exploits are so much motor-car history. Mr. Johnson was Secretary of the Automobile Club from 1897 until his retirement in 1903, and as an organiser in connection with motor exhibitions, speed trials, the Gordon Bennett race in Ireland, and other events, is well known in the motor world.

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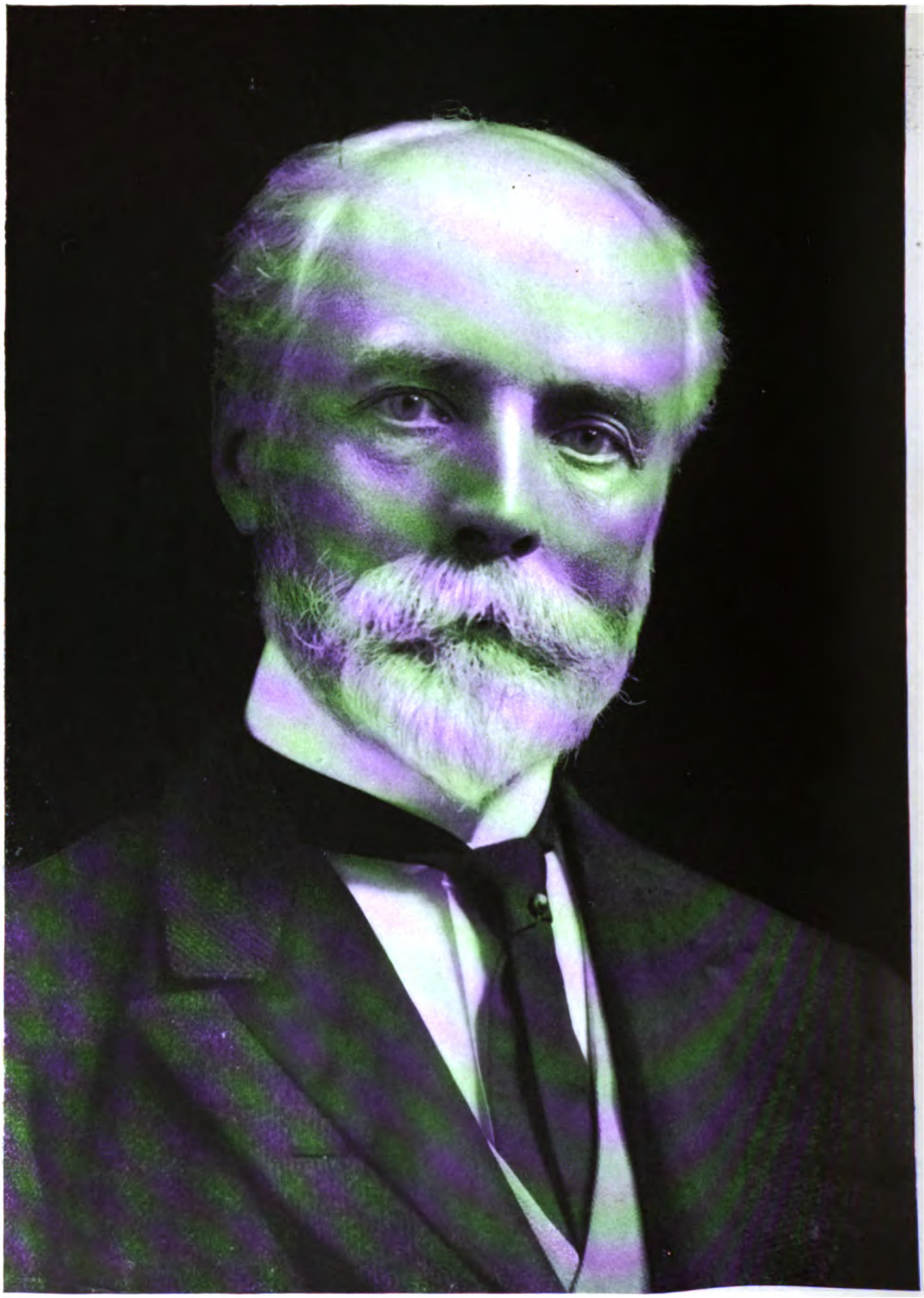

HIS EXCELLENCY THE HON. WHITELAW REID

THE NEW AMBASSADOR OF THE UNITED STATES TO GREAT BRITAIN

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The World's Work And Play

EDITED BY HENRY NORMAN, M.P.

VOL. V LONDON, MARCH 1905 No. 28

AFTER THE MOTOR SHOW

A TRIUMPH OF BRITISH MOTOR MANUFACTURE—THE PROPER WAY TO BUY A CAR—LADIES AND MOTORING—OPPORTUNITIES FOR WOMEN TEACHERS—THE END OF THE 'BUS-HORSE

BY

THE EDITOR

THE motor show at Olympia was a splendid success. It was crowded with visitors from morning till night. The show of cars, vans, and boats was incomparably the best ever seen in this country, and equal to any show elsewhere. All the best makers have done excellent business, in some cases far surpassing their anticipations, and the number of the non-motoring public has been sensibly reduced. The vehicles at Olympia represented a cash value of nearly three-quarters of a million sterling. More gratifying than all, however, is the fact that the show has proved beyond question that British motor manufacture need no longer take a second place to that of France. America is years behind, and her cars are to all intents and purposes a negligible quantity in European motoring, while Germany produces nothing of interest except the famous Mercedes, and Italy is only known by the Fiat car. As good a car can be bought in England to-day, home-made, as can be had anywhere, and I confidently anticipate that it will not be very long before British makers will be justly claiming to turn out the best cars in the world. Being a politician as well as a motorist I cannot refrain—and I hope protectionists among my readers will pardon the excursion—from observing that this is a splendid triumph for Free Trade. In spite of all their protective tariffs, and in spite of the fact that our makers were grievously handicapped for several years by the law treating pleasure vehicles on a par with traction engines, we have fought our way to the top without hoisting the white flag. This is, of course, due to the fact that under Free Trade our manufacturers must either meet ingenuity with greater ingenuity, and enterprise with greater enterprise, or go out of business; that our artisans when given a proper chance are the most efficient in the world, and that, while they get high wages, the cost of labour to a manufacturer is low, owing to the cheapness of food and all commodities, and that we enjoy free admission of semi-manufactured materials. The failure of America in spite of the long-famed ingenuity of her people and a protective tariff equally unscrupulous and complicated, is especially noteworthy.

I cannot pretend to describe or discuss here all the types of British automobiles. I must devote a whole long article to this later on. Many of them are world famous, like the Napier and the Daimler. Some of them have worked their way steadily to the front, like the Argyle, the Star, the Sunbeam, the Albion and the Belsize, which I hear well spoken of. Some are newcomers whose excellence has won

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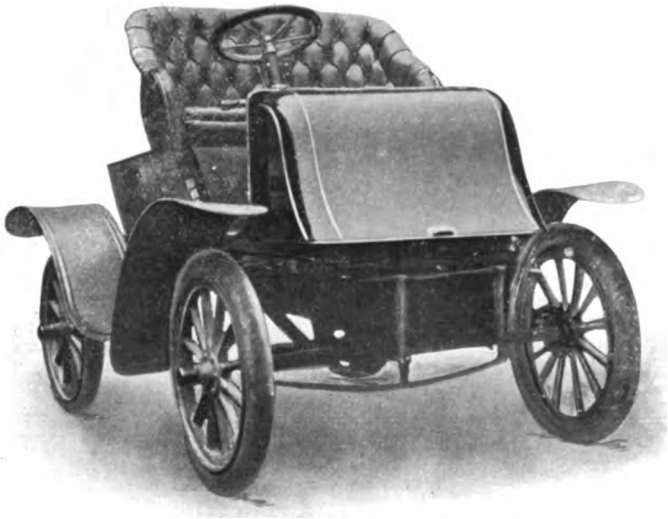
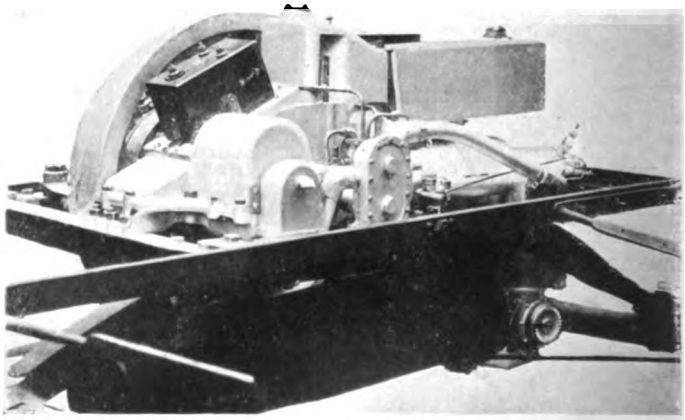
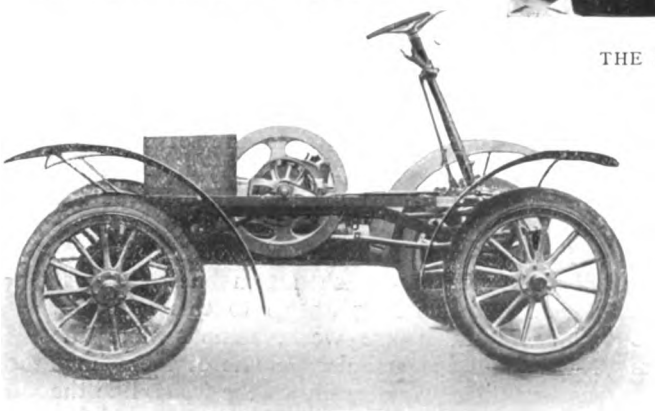


THE ADAMS-HEWITT 9 H.P. LIGHT CAR

them a prominent position immediately, like the Rolls-Royce. Beyond these, and I have by no means attempted an exhaustive list, the show at Olympia proved that in the most elaborate types of cars, costing the highest prices, British enterprise is working hard and successfully. For example, the Brotherhood-Crocker car, made by the famous firm of manufacturing engineers of the first name, was perhaps the one most noteworthy thing at Olympia. I spent some time going over every detail of the mechanism, and while I have had no opportunity of trying it, and while obviously its novelties must be proved by the test of experience, I was delighted with the great intelligence that had been shown in design, and the thoroughly workmanlike manner in which this had been embodied. I particularly liked the automatic timing of the ignition, and the new method of applying and releasing the hind wheel brakes. With regard to the control by twisting the foot to right and left, I am not convinced. Another expensive chassis which interested me much, was that by Messrs. Legros and Knowles, which also was of most excellent workmanship, and displayed some admirable novelties in construction. The



THE ENGINE OF THE ADAMS-HEWITT CAR



THE CHASSIS OF THE ADAMS-HEWITT CAR

Adams-Hewitt 9 h.p. car was the principal novelty in British small cars, and since, as my readers know, I am personally interested in it, I was much gratified by the attention it attracted and its success.

I piloted around the show several friends looking for expensive cars, and the sad fact was more than ever borne in upon me that the majority of purchasers buy a car from the body alone. This is doubtless inevitable, as a man of means looking for his first car does not, as a rule, know anything whatever about motor

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THE ADAMS-HEWITT LIGHT DELIVERY VAN

engineering. But it was pathetic to see ladies going from stand to stand, intelligently criticising every detail of body construction, upholstery, and decoration, practising getting in and out, and testing the softness of the cushions, and finally ordering the car which was most luxurious to sit in and would look best at their front door. Yet these ladies would never dream of buying on their own responsibility a domestic electric lighting plant, though to do so would be far easier and safer than to buy a motor-car. People who can afford it should realise once for all that the proper way to buy a car is to consult some professional expert, or some private friend in whom they have confidence, and upon the advice they thus receive, buy from the makers the chassis only, and then have the body built to their own design by a reputable firm of carriage builders who know how to make motor bodies. Of course this takes time, and if they have deferred their purchase till the beginning of the motor season, it may be too late for them to do so, but it is beyond question the only wise procedure.

* * * * *

The certain rapid increase in the number of two-seated light cars will have one interesting social result. The number of ladies who will own and drive their own cars will be very great. I remember when a woman on a bicycle was thought rather a daring and unconventional person. Now almost every woman cycles, and the effect upon the character and health of our young womanhood has been incalculably good. To-day it is unusual to see a woman out by herself in a motor-car. A year or two hence we shall think nothing of it. The number of women who can afford—or their relatives for them—to buy a light car must be very great, and when they have found a car they can trust, and discovered all the interest and pleasure and health it can give them they will adopt the practice by thousands.

There is nothing whatever in a good small car that an intelligent woman, who can manage a sewing-machine, for instance, cannot quickly master. The legend that the "machinery" of a small car is utterly mysterious and beyond ordinary comprehension, will soon die. A smock of blue jean, a pair of strong loose gloves, and a few days of teaching, and the most dainty lady may safely undertake the management of her own light car. All the extraneous help she will need is the groom or gardener or any handy boy to wash the mud off. And think of the pride of having your own car, understanding it, adjusting it, and taking out your friends for a ride, without having to consult the convenience or beg the assistance of a man!

These thoughts also suggest a new money-earning occupation for women. There will be fine opportunities for women teachers of motoring. A lady who buys a light car will not care much to go to a garage to be taught by some dull mechanic. It would be far pleasanter to have a bright person of her own sex come for a week or a fortnight and teach her all about engine and sparking-plug and wiring and clutch and brakes, and then driving on the road. It would be a pleasant and well-paid occupation—five guineas and board and lodging would be a fair price for lessons enough to make the pupil efficient—and there is not the slightest reason why any clever young woman with good nerves and common sense and solid health should not fit herself in six months to teach single car-care and car-driving. And assuredly it would be an infinitely more interesting occupation than the dull round of cramped office-work. I fully expect to see my suggestion bear fruit, and six months hence to come across this advertisement

From the *Autocar*

AN EXCELLENT WATER-PIPE CONNECTION

Invented by E. J. Hardy, Coventry

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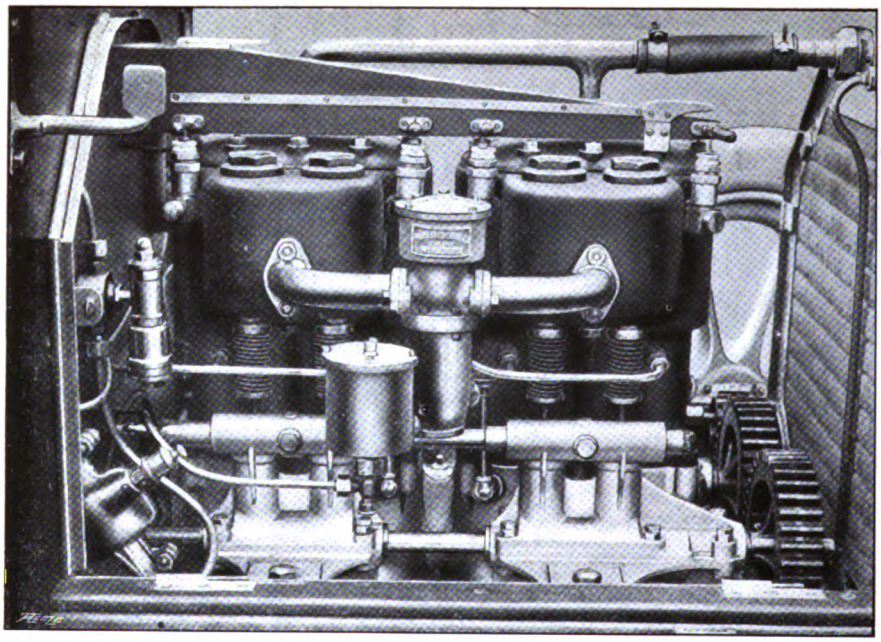


From *Motoring Illustrated*

THE BROTHERHOOD-CROCKER ENGINE, FROM THE INLET SIDE

Showing the casing carrying the rack actuating the pinions for giving a variable lift to the inlets, also the carburettor

in the motor press and THE WORLD'S WORK AND PLAY:

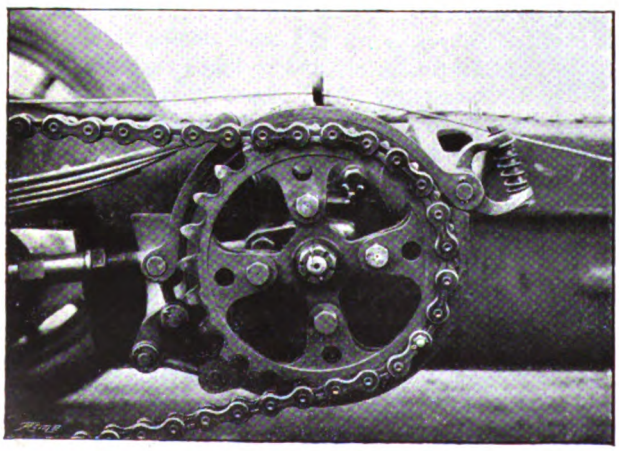
MISS —— is prepared to instruct ladies in London or at their own homes in the management and driving of light motor-cars. A complete course of teaching, fitting any lady to take sole and independent charge of her own car at home and on the road, occupies the pupil's whole time for a week.

TERMS: £5 5s. for the course, with railway fare and board and lodging. The Editor of THE WORLD'S WORK *kindly permits reference to him regarding the advertiser's experience and efficiency. Address, &c.*

* * *

Less than two years ago I ventured to prophesy that within ten years horses for traction would practically have disappeared from the streets of London. The forecast was considered rash, but some of it is coming true faster than even I thought possible. The day of the motor-omnibus is at hand. Anybody who has watched the splendid big ones slipping through the London traffic and then sailing majestically away when the road was clear before them must have realised then that was the method of future public locomotion in crowded thoroughfares. The trial 'buses have behaved well, and now we learn that orders for large numbers have been placed by the omnibus owners. One of the obstacles to their wide adoption is the value of the thousands of vehicles now running, which would fetch very little if sold. But

SECTIONAL VIEW OF THE NEW BROTHERHOOD-CROCKER AUTOMATIC CARBURETTOR



From *Motoring Illustrated*

THE BROTHERHOOD-CROCKER BRAKES

Showing the toggle action for applying them, and the "quick-release" spring devices

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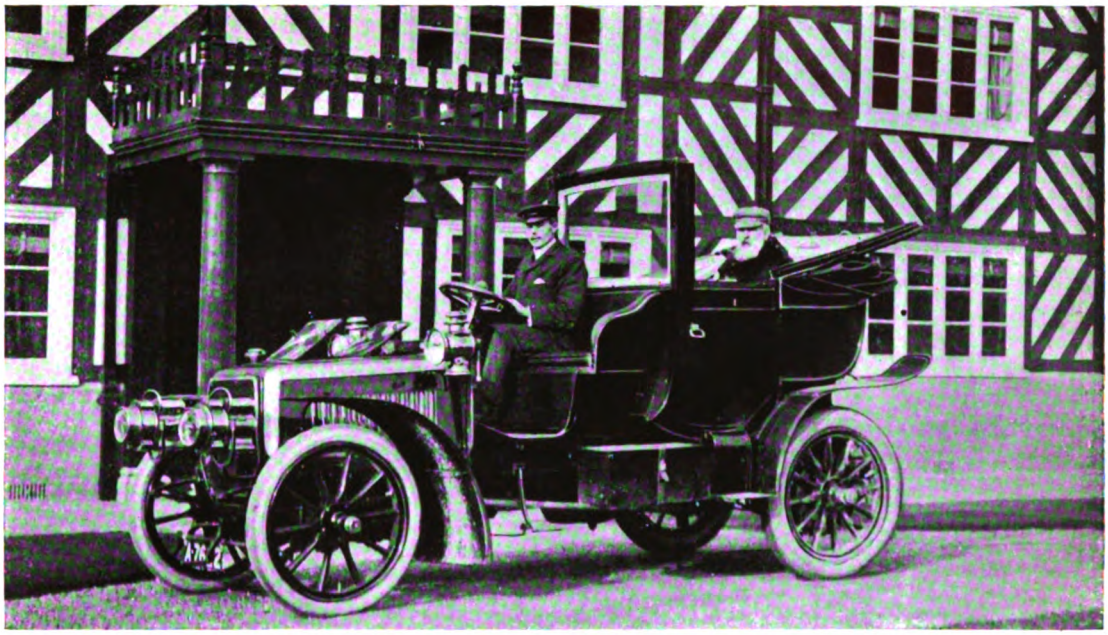
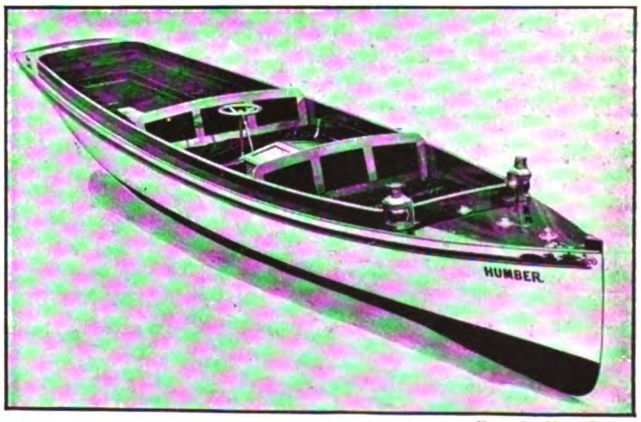


SIR JOHN BRUNNER, M.P., IN HIS NEW 24 H.P. PANHARD

one of my photographs last month shows how this difficulty has been got over, by mounting one of the existing bodies on a motor-chassis. This appears to be a success, and if so, it certainly removes the greatest bar to the adoption of the motor-'bus. What a difference to London when this revolution in traffic is accomplished—what an enormous saving of people's time—what an advantage to public health—what a lot of suffering spared to toiling horses! A word of warning, however, to motor-'bus proprietors. One magnificent 'bus passes me several times a day, and I am sure it is not getting the attention it needs. Such a vehicle cannot possibly run seven days a week. It is growing noisier, and I can tell by its noise that it needs adjustment at various places. Disappointment is sure to result if omnibus proprietors get the idea that all they have to do is to buy these motor vehicles, and then let them run. The most skilled and experienced foreman-mechanic they could find, with autocratic powers over the running of the vehicles, would be an economy at any salary.

No fewer than fifteen hundred motor-'buses are on order for London alone, and a very interesting and pertinent question is raised in connection with this by Dr. Ormondy in a learned lecture he recently delivered upon motor fuels. A 'bus averages ten miles to a gallon of petrol, and each 'bus runs fifty miles a day; that is, five gallons a day and fifteen hundred gallons per 'bus per year of three hundred days. Thus two and a quarter million gallons of petrol will be wanted each year for the omnibus service of London alone—and we are dependent for our supply of petrol upon three syndicates, and there is no alternative fuel! A more conclusive argument for the immediate change of our excise laws, in order that our motor services, public and private, may be run by home-made, non-drinkable alcohol, a more efficient fuel than petrol, cannot be desired.



From the *Motor Boat*

THE HUMBER RIVER BOAT

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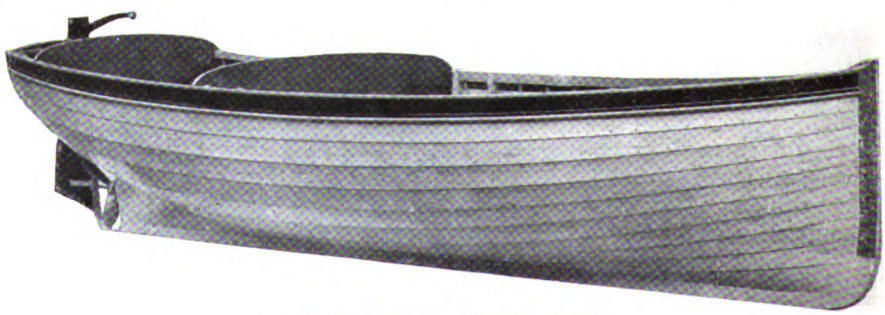
A LONDON MOTOR OMNIBUS

Built by the Milnes-Daimler Company

Mr. E. J. Hardy, of St. Nicholas Street, Coventry, sends me an ingenious and useful fitting for the water-pipe connections of motor-engines. Every motorist knows how often these leak, even when they are bound with copper wire, and it is always a nuisance to unbind one of these when occasion arises to remove it temporarily, and by no means every mechanic can bind it up neatly again. As will be seen by the illustration, this consists of a short length of brass pipe, one end of which is to be soldered to the tank or water jacket connection, and the other end of which is coned to have the india-rubber pipe slipped over it. Another brass pipe with a thread upon the inside is slipped over the rubber tube, and this is screwed tightly over the pipe on the coned piece. The rubber tube is thus firmly gripped, and a simple, cheap, and readily detachable connection thus secured.



A HANDY MOTOR DINGHEY

Fitted with the "Neptune" 4 h.p. water-cooled exhaust and silencer, it gives a speed of eight to ten miles an hour

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THE AUTOMOBILE AMATEUR IN 1905

ABSENCE OF TROUBLE THE MAIN THING—GOOD WORKMANSHIP IMPERATIVE —FAULTS OF SIDE ENTRANCE BODIES—WHY IS THE PUMP NOT ABANDONED? —THE COMING BATTLE OF IGNITION SYSTEMS—WANTED, THE ABOLITION OF "EXTRAS"

BY

AN AMATEUR

THE amateur has been the life and soul of automobile development. It is through his difficulties and troubles, the expenditure of his money, and, above all, through his enthusiasm, that the motor-car has attained its present degree of efficiency. The question now remains: Is that degree sufficiently near perfection to enable the amateur to look forward to the enjoyment of a better time in 1905 than in any previous year?

Certainly, when one's gaze travelled round the imposing display of motor vehicles at the Olympia Show, the glamour of one's immediate environment was all but enough to force the conclusion that the motor-car was now perfect. If it is not possible to say quite so much, however, when detached from that magnificent aggregation of up-to-date vehicles, this much at least can be readily conceded—that the average car of 1905 is a better product than its predecessor of last year. And it is not better by reason of any revolutionary change, but as the direct result of more careful attention to detail. I had almost written minor detail, so easy is it to fall into the habit of regarding details as "mere" or "minor." Speaking as an amateur, nevertheless, who has driven his own cars, and known what it is to wrestle with troubles that mostly might have been avoided by a little forethought in the factory, I am constrained to urge that it is the details believed by the maker to be "minor" that are in effect the main essentials of a practically useful car.

Time was when we judged the efficiency of a car solely by its speed. Progress was measured by the ability of a newcomer to travel more rapidly than anything which preceded it. Nowadays, however, speed is practically a question of the amount of money a man is prepared to put down. If he can afford a 90 horse-power car, equipped with touring body, it can be delivered in answer to his cheque, and between this leviathan and the tri-car there is an infinite variety of choice. What a man wants, however, is the best car he can obtain at a given price, and to some people, no doubt, the best thing in this connection is the fastest. Fond as I am, however, of fast travelling, and by no means able to afford as high-powered a car as I should love to drive, I have learned enough, both subjectively and objectively, to know that absence of trouble is the main thing to be desired in the automobile of the amateur.

Up to now we have heard far too much of systems, and not enough of workmanship. The importance of finding the best system to work upon I would not wish for a single moment to depreciate; one cannot have successful practice without correctness in preliminary theory. In motor-car construction, however, it may be laid down as an axiom that a first-class system, badly worked out, is considerably worse than an inferior system which is carried through with good material and thorough workmanship. The advantages, for example, are about equally divided with regard to the two main systems of transmission—by chains and live axle respectively. The fact none the less remains that either will give satisfactory results if properly made. The service which the motor-car is called upon to fulfil is to cover an intervening distance between two given points. It is not the items which help the car to get through in the fastest time which the amateur has especially to consider, but the items which interrupt the even progression of his journey, or even prevent him getting through at all.

Now nothing is more surprising in motor-car construction than the way in which a detail which is satisfactory in one type of car is a source of endless trouble in another, while the latter,

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on the other hand, is free from a defect of a kind which nevertheless manifests itself unmistakably in the former. Jones, for instance, complains to Brown of defective lubrication. "Oh!" replies Brown, "I have never had the slightest trouble with my oilers. I turn on the taps and that is all." Then, while Jones is still mentally contemplating his oily plugs, Brown happens to observe: "By the way, does your pump work all right? Mine gives me a lot of trouble." It is now Jones's turn. "Mine works perfectly," he says; "and I simply don't know that I have got a pump." Quite frequently, however, in cases of this kind it is found on examination that there is no radical difference between either the lubricating systems or the types of pump employed; it is simply that on one car the particular article is badly made. There are systems and systems, it is true, but the best of them may be vitiated by faulty construction. Again, one may find drivers who have experienced over-heating troubles—apart from the question of lubrication, that is—but when the matter is inquired into it does not by any means follow that the trouble is confined to honeycomb radiators or to any other type. For each case of defect, examples may be found of satisfactory working with the same system, and for every instance of effective working by another system one may happen to encounter cases of defect. Whatever type of radiator a maker elects to adopt, the first considerations to his clients are that the radiator shall be well made, and that it shall have a sufficient area of cooling surface to allow an ample margin of safety.

In the process of time, of course, certain systems do prove their general superiority, and the search for these must never cease; I have merely emphasised in passing the fact that perfection of workmanship, though of high importance, is too frequently ignored. Looking round the recent Olympia Show, it was impossible not to realise that two once favourite systems have had their day. One is the use of the friction-driven pump, and the other the employment of gravity lubrication. It is true that one may see on sundry 1905 cars the old-time pulley, placed low down by the fly-wheel, where it catches all the dirt, and frequently fails to act. I remember that in the Thousand Miles Trial of 1900 there were more troubles with pumps than with any other detail; in fact, it was said at the time that the three weeks' tour was a "pump trial." In the same year I bought a car which happened to be fitted with a gear-driven pump, and though I drove that vehicle constantly for over a year I never had occasion even to look at that particular fitting. On the other hand, I often found friends with much more expensive cars encountering troubles with this important detail, owing to the use of the friction-driven type, and in one of my subsequent cars I myself had no small degree of annoyance from the same cause. Some have worked better than others, for the very reason I have suggested above, namely, that workmanship is of importance as well as system; but from the paucity of examples of this type on the cars of 1905 it is evident that the majority of the manufacturers have come to the conclusion that the system is itself erroneous.

Gravity lubrication again is clearly doomed, and is already abandoned on the majority of 1905 cars. If the gravity lubricator be well made, and the driver be ever on the watch, he may get along without much trouble, particularly in warm weather, when the oil flows freely. When, however, one has to struggle with an example of lubricator which is not only inferior as to its system, but is badly made into the bargain, troubles of the most irritating character are unavoidable. My last car was fitted with a wretched device of this species. It was impossible to adjust the sight-feeds in such a way that they could be depended upon to act with regularity, and the makers of that car, had they put five or ten pounds on to the price and fitted a decent lubricator, would have saved an infinity of trouble to their clients, and enhanced their own reputation at the same time.

Amid much that is manifestly for the better in the designs for 1905, there is one new feature which, though, curiously enough, practically universal, is distinctly open to question. It is not *primâ facie* a mechanical matter, though indirectly certain mechanical considerations are included in the problem. I refer to the fitting of side-entrance bodies to open cars. The system is full of faults, none of which appear to have been realised; and nine out of every ten men to whom one may speak in depreciation of the side-entrance body will immediately reply: "Oh! it is so much more convenient for ladies. What lady wants to step out on to a muddy road when a side-door allows her to leave the car by the kerb?" The argument is unanswerable where vehicles for town use are concerned. But people who habitually use their cars for theatre-going and shopping will naturally prefer a covered car to which a side-entrance body is a prime necessity. The

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touring-carriage, on the other hand, is quiet another vehicle. How often, as a matter of fact, does one find a kerb, or even a raised foot-path, on a country road? Indeed, on narrow highways a car with a side-entrance body would be more likely to involve the necessity of stepping into the muddiest portion of the road than would be the case with a tonneau, from which a passenger would alight on to the centre, or highest, and therefore driest portion of the surface.

But even if the side-entrance argument held good *per se* in every instance, and one were assured of a perpetual continuity of kerbs, the fact would still remain that the new method brings within its train a whole sheaf of disadvantages. In the first instance, it makes the car more costly. Any maker who still fits tonneau-bodies will charge anything from £25 upwards for the fitting of the side-entrance type at option; if, on the other hand, he no longer makes any tonneau bodies at all, the price of his car will have been advanced since last year. I have studied catalogues galore, and find in every case, where direct comparisons can be made between the patterns of last year and this, that the price of a given type of car has been materially increased in consequence of this one fitting. Then, again, the comfort of the passengers is materially affected. The tonneau-body is eminently adapted for the use of ladies, inasmuch as the rear passengers, owing to their nearness to those in front, are sheltered. In the side-entrance type, however, unless the doors are very narrow—in which case mounting and dismounting is distinctly awkward, as could be seen from various cars which were actually on view at the Olympia Show—the new departure involves the lengthening of the distance between the front and rear passengers. This means that the air displaced by the first-named is not carried past the rear occupants, but sweeps round in front of them; the latter, indeed, on a cold day are every whit as badly off in the matter of protection as those in front.

In addition to loss of comfort, moreover, there are other evils to be ascribed to this unreasonable fashion. The lengthening of the body of necessity involves the lengthening of the frame, and the same remark applies to the propeller-shafts. Either the strength of these must be sensibly reduced, with the resultant evils of a whippy frame and faulty transmission, or else more weight must be imported into the *chassis*; and this, in addition to that already added to the body, is distinctly a step backwards. The lighter the car the less wear there is on the tyres, and it is scarcely consonant with the law of progression that, after so much attention and skill have been devoted to the elimination of weight, we should have to make a retrograde movement in consequence of a purely adventitious factor like the side-entrance body. Another item which may be mentioned in this connection is that makers appear quite at sea as to the best method of distributing the extra length in the transmission. Some put it entirely in the propeller-shaft; others leave the ratio between the differential and the gear-box as before, but lengthen the distance between the latter and the clutch; while, in other cases, the clutch-shaft and the propeller-shaft are each lengthened in half-measure. Now on many cars the change-speed gear and differential are quite difficult enough of access even when there is the minimum possible space between the fly-wheel and the gears. How much worse is it, therefore—and in certain cars this is particularly noticeable—when the extra length due to the side-entrance body is imported entirely into the clutch-shaft. These are points which have received little attention in the Press up to now, and I venture to say that during the coming season many amateur owners who attend to their own cars will have cause of complaint as to the accessibility of their change-speed gears and differentials.

Perhaps the most important disability of all, however, that the lengthening of the side-entrance bodies has brought in its train is with respect to the ease of handling the car in traffic. We had emerged from the short wheel-base era to that of the comfortable length before a single side-entrance phaeton was ever seen, and even then a car that was long enough for comfortable riding, and for steadiness in grease, was too long rather than otherwise in the matter of ability to turn round in a narrow road. The side-entrance body, however, has added, on the average, another foot, and on many cars without a corresponding increase in the width of lock. Hence it is not improbable that the spectacle will frequently be seen during the coming year of a car holding up a line of traffic, while its driver gets in his reverse. The conclusion is irresistible, when the factors of the problem are duly analysed, that it is a heavy price which is going to be paid for the privilege of stepping on to a kerb, which—to use an Irishism—is often not there at all.

I have remarked above on the advantages of the geared pump as compared with the friction-driven type. The coming season should afford

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interesting object-lessons, however, in this matter as to the feasibility or otherwise of using no pump at all. While unlimited discussion has been waged around the merits of the honeycomb and gilled radiators respectively, with pump-driven circulation, certain makers have been using the thermo-syphon system. It has been employed on the Richard-Brasier, which last year won the Gordon Bennett Cup; it has all along been used on the Renault cars, which have enjoyed throughout an enviable reputation in France; it is further adopted on the British-made Argyll; and, so far as I am aware, it has proved satisfactory in all these cases. If natural circulation, therefore, is fully adequate for the requirements of the occasion, why should makers trouble to provide a forced drive? The point is of no small interest, and really it puzzles the wit of man to know, if thermo-syphon cooling is really effective, why the pump is not abandoned once and for all.

Another problem, and a much greater one, as to which some reliable data ought to be forthcoming during the next twelve months, concerns the question of ignition. By a gradual but steady advance the use of magneto ignition has been growing on the Continent, in consequence of the enormous success of the Mercédès car. At the last Paris *Salon* the ordinary high-tension system with accumulators was found for the first time to be in the actual minority. Curiously enough, however, notwithstanding the fact that the cars which have made a name for reliability through the use of magneto ignition—such as the Mercédès, the Richard-Brasier, the De Diétrich, and others—have all been using the low-tension method; yet of those makers who were seen at the *Salon* to have adopted the magneto for the first time the majority resorted to the high-tension system. Hence the year 1905 is bound to see a great battle of ignition systems, not only of the ordinary high-tension with accumulators as against some form of magneto, but between low- and high-tension magnetos respectively. It is conceivable that some makers are experimenting with high-tension magnetos because certain disadvantages have been discovered in the low-tension system in the light of the several years' experience which is now available. It has yet to be shown, however, that high-tension magneto is freer from fault than the low, and meanwhile the question is still undetermined as to whether either is better than the ordinary high-tension ignition with accumulators.

One cannot conclude a disquisition upon the problems before the automobile amateur of 1905 without reference to sundry items which suggest themselves as desirable in the interests of manufacturers themselves, and consequently for the benefit of their clients. Not every one knows that there is a far wider diversity in the quality of carriage-bodies than the uninitiated would suppose; the makers, therefore, who put good work into their *carrosseries* do themselves a substantial injustice if they do not call attention thereto in their price-lists. One may find fairly smart-looking bodies which would not cost the maker more than £25, while on even cheaper cars there are bodies fitted of which the factory cost is from £50 to £75. I am referring, of course, to open cars of the tonneau or side-entrance type, without reference to the larger and more elaborate and expensive covered carriages. Would it not be vastly better if every maker in his catalogue stated—as, in fact, is the habit of most French makers—the price of the *chassis* apart from that of the body? Otherwise there is a direct inducement to fit paltry carriage-work, and this is particularly important when one considers the growing number of race meetings—the programme for this summer is tremendous—in which the classification is almost invariably by price. Thus, the maker who builds a *chassis*, say, worth £700, to which he affixes a body worth £100, is debarred from competing with the car of another maker who, we will assume, makes a *chassis* of precisely equal value, but fits a body worth only £50, and may thus compete in a class with a £750 limit. As a matter of fact, this sort of thing has already actually occurred, where a firm fitting really good bodies on to a good car has nevertheless been unable to meet on equal terms a type of car which is inferior mechanically, but selling at a lower price and coming within a lower class, merely on account of the inferiority of the carriage-work. With the same body on each car, the one vehicle would have been able to show a considerable advantage over the other, but for the reason stated has been forced to pit itself against cars costing several hundreds more, and with engines very much more powerful.

To my thinking, another reform which is necessary is the abolition of extras. One cannot, of course, expect a maker to fit acetylene lamps, because some of them are exceedingly expensive, and not every purchaser would care to use the most powerful type. But the average man, when he gives his order for a new car, does not wish to be confronted with a gross of extras which are absolutely essential to the

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use of his new possession. Paraffin headlights, a good horn, and a tail-light, with the necessary brackets for each, and a really complete set of tools, should undoubtedly be included in the advertised price of a motor vehicle; and with open cars a cape-cart hood at least might be regarded as an essential rather than an extra. Surely, too, a luggage-platform at the rear of the car, to fold up or slide beneath the floor, ought to be included. Just as a watch-maker, moreover, tests a watch before selling it over the counter, every maker should run his *chassis* on the road to determine that all the adjustments are correct. Some firms do this, but by no means all. Again, as new accumulators run down with frightful rapidity until seasoned, they might at least be charged and discharged half a dozen times in the factory before passing into the owner's hands. It is practically no extra trouble or expense in the workshop, and the absence of this precaution frequently involves the owner of a new car in annoying trouble and expense. He may be stranded on the road because an accumulator which should have run five hundred miles has not run a hundred, and even at his own home he may be some distance from a charging-station. Now that there is a plethora of good cars, and that competition is much keener than heretofore owing to the fact that, great as is the increased demand for cars, the actual supply is even greater, the makers who will gain and maintain the goodwill of the automobile community will be those who aim at turning out the most reliable car, fitted in the most complete fashion, and guaranteed to give the minimum of trouble in the hands of a reasonably careful owner.

THE URGENT NEED FOR LAND REFORM

A PRACTICAL SCHEME OUTLINED

A THOROUGH REFORM OF THE LAND LAWS WOULD DO MORE FOR TRADE THAN ANY EXPANSION OF EXPORTS—THE LOSS TO THE COMMUNITY BY THE PRESENT SYSTEM — HOW IT PENALISES ENERGY — LAND, THE PRIMARY ELEMENT OF PRODUCTION, MUST BE PLACED ON A FREE TRADE BASIS—HOW THIS CAN BE DONE

BY

J. H. WHITLEY, M.P.

"COME with me," said Richard Cobden, as John Bright turned heart-stricken from his young wife's grave. "There are in England women and children dying with hunger—with hunger made by the laws. Come with me, and we will not rest until we repeal those laws."

THIS was the spirit that won the first Free Trade victory; this was the source of the energy that triumphed over vested interests, restricted franchise and aristocratic privilege to gain the right of free exchange in the products of Labour. No narrower spirit will avail for the second and greater campaign, the freeing of the Land, the fight for the Freedom to Produce, without which the abolition of Protection is but a half-won battle.

In spite of Free Trade, in spite of the wonderful blessings that Free Trade has brought to us as a nation—the almost fabulous increase of national wealth, and the substantial improvement in the lot of the majority of even unskilled labourers both in town and country—in spite of all, there is still poverty and hunger in the land, undeserved, made by law, or, what is the same thing, by the absence of the right law.

This is no new truth. Cobden saw it. Cobden taught it. Remember this when you are told he was not a far-seeing man. His teaching on the Land question cannot be better summarised than by the following words of Sir Louis Mallet written in 1867 as an introduction to a volume of political writings:

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"Cobden held that the growing accumulation in the hands of fewer and fewer proprietors of the soil of the country was a great political, social, and economic evil; and as this tendency is unquestionably stimulated by the system of our government, and some of our laws, which give land an artificial value, he foresaw that one of the principal tasks of the generation which succeeded him must be to liberate the land from all the unnecessary obstacles which impede its acquisition and natural distribution, and to place it under the undisturbed control of the economic law. It is obvious that laws which keep land out of the market—laws of entail, laws of settlement, difficulties of transfer, as well as a system of government which gives to the possession of land an artificial value, for social or political purposes, over and above its natural commercial value—must have the inevitable effect of restricting the quantity, of enhancing the price, and of diminishing the product to be obtained. Land thus acquires a monopoly price, small capitals are deterred from this form of investment, competition is restricted, production is diminished, and the condition of those who live by the land, as well as of those who exchange the produce of their labour for the produce of the land, is necessarily impaired.

"In his speech at Rochdale in November 1864, which was his last public utterance, Cobden especially left this task as a legacy to the younger men among us, and told them that they could do more for their country in liberating the land than had been achieved for it in the liberation of its trade."

Why is this legacy still unclaimed? Why is the task still unattempted? It may seem a strange thing to say, but I believe the reason is that Free Trade was too quickly successful. It brought wealth so rapidly that many of the fighters for reform piled their arms instead of advancing from the outpost to the main position; a half-won battle was mistaken for the final victory, and it was forgotten that of two burdens on Trade only the lesser had been beaten down, and that the great monopoly remaining had the power of drawing to itself the strength of its defeated companion.

Here is the true antidote to Mr. Chamberlain's poison! Instead of revoking Free Trade, go on and complete it by freeing the Land! Let Free Traders discharge their full mission, let their defence be attack; let them bring to bear on the question of the Land the same clear economic truth that has made the case for free exchange so unassailable; let them counter the false remedy "Restriction of Supply," by the true one "Expansion of Demand," let them sweep away the artificial barriers that still block the path of industry, and remove the monopoly which absorbs an ever-increasing portion of the results of improvement and invention, and keeps in perpetual poverty a large fraction of the people.

Land is the primary element in the production of wealth; without it labour and capital are of no avail; except on it or in it no human activity can exist.

Capital is only the reserve of previous labour applied to land, and can be created or destroyed, diminished or increased. Its proper sphere is to provide machinery and organisation whereby the productivity of labour may be increased. Its undue power over labour is dependent on the exclusion of labour from access to the land so that men must beg for work deprived of the protection of Nature's intended minimum—the reward of simple toil on mother earth.

Labour is the effort of man to use Nature's gifts to produce useful things; but if the primal gift—the land—be held by a few, with power to grant or withhold, then indeed the labourer may be all his days a beggar in the midst of plenty of his own creation. All this is true as well in a complex industrial society as in a simple agricultural community.

The economic position of land, therefore, is, far more than tariffs, a controlling factor both in the production and in the distribution of wealth; and in any real system of Free Trade it is of the utmost importance that land should be on a Free Trade basis—that is to say, its use should come naturally and easily at its commercial value to those who can use it best.

Let us consider how things are under the existing system. In a country where all the land is claimed by so-called owners, even though vast areas may be quite undeveloped, all other men must pay for the right to live and the right to work. The power to exact payment depends not on the right to use the land, but on the right to withhold it from use; the extent of the payment depends on the proportion of his produce that the producer can be made to part with in exchange for permission to be a producer. As population increases, and civilisation progresses, the balance of bargaining power tends to be more and more unequal, and brings about the phenomenon of idle rich at one end of society and workless poor at the other. This is inevitable as long as we permit unrestricted the power to withhold Nature's gifts.

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A simple illustration will, perhaps, more clearly emphasise the fact.

Suppose an African tribe living on an oasis, watered by a single well. Water is the natural monopoly, which labour cannot create or increase. So long as all have equal right of access to the well, wealth will be proportionate to industry and care of flocks. But if one man obtains ownership with right to withhold, whether gained by force, or fraud, or purchase, a very different case will be seen.

Terms must be made by the would-be users for access to their first necessity. At first the terms of access will be light; but with every payment the power of the owner to abstain from bargain will increase, while the power to abstain of those denied free access to the essential of life remains merely their distance from starvation. By degrees the terms will be raised until the users are left with the minimum that will induce them to go on working with decent contentment, or without a revolution, and the whole balance of their produce has been absorbed by the owner.

So always, a monopoly in a limited gift of nature tends to the minimum reward of industry—a minimum which necessarily leaves the less capable workers below the line of proper subsistence.

In a modern community these economic forces are to some extent disguised and modified. The single owner becomes a class of owners with a certain limited internal competition modifying their power; some of the users are able by reason of reserve of wealth or by combination to resist the extremity of pressure. But disguised or modified, the forces are there all the time, causing both hindrance in the production of wealth and inequality in its distribution, and tending to absorb in land values the major part of every social improvement and every new invention.

We have seen what results might be expected from a system just such as exists. Are these expectations confirmed by experience? I think they are. It would be waste of time to quote a flood of facts showing the vast increment of land values in London, and in every town where a vigorous people labours. Every citizen knows such instances by the score, or by the hundred.

A large number of the leases of the great London ground landlords are now falling in, and what are by a delightful irony called "fines" are being exacted from the tenants for the grievous sin of having been industrious enough to build up a business, and of desiring to continue even at an increased rental.

A very experienced builder and contractor, who knows London property intimately, has estimated that these "fines" on the Duke of Westminster's estate will amount to at least £500,000; and in a book called *The Great Landlords of London*, it is stated by Mr. Banfield that on the Portman estates in 1888 they amounted to £1,250,000.

One of the London Boroughs recently had to buy land for a cemetery; they went as far out as they dared having regard to the cost distance imposed on poor people's funerals, and yet for land rated and taxed as agricultural they had to pay £975 an acre.

So the poor Londoner has to labour while he lives, to create values which he must buy back before he can be buried when he dies!

It is almost a truism to say that these values are created by the labours and extracted from the needs of the people as a whole. Remove the population, cease your industry, and where are your land-values? They can be none other than a deduction from the wages of industry. They are the price of permission to be industrious.

Do they, in fact, tend to absorb other benefits which should relieve the lot of those who work? On this point Mr. Charles Booth in the final volume of *Life and Labour of the People of London* says:

> "When for the advantage of the consumer, and in the interests of the towns and of trade, the food of the people was relieved of a large part of the taxation it had borne, it seems to have been overlooked, or not fully foreseen, that the houses the people lived in were, or would come to be, even more heavily taxed than their food had ever been, and that free internal development would be hindered by the peculiar incidence of this burthen."

Look at the latest Board of Trade Blue-book, that interesting Christmas present to the Tariff Reform League, and you find (p. 31) that in twenty years, from 1880 to 1900—

cost of food *fell* from 139 to 101—
cost of clothing *fell*, from 108 to 98—
rent (London) *rose*, from 87 to 100—
rent (twenty large towns) *rose* from 85 to 100
rent (Great Britain except London) *rose* from 79 to 100.

And on page 49 you will find that the poorer the class of house, the greater is the increase. In the poorest class, houses under £20, it reaches 25 per cent.

It is not possible to obtain any such careful

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figures for a period preceding 1880, but I think there can be no doubt that from 1860 to 1880 the same process, food down, house rent up, was in operation to an even more striking extent. Sir R. Giffen in 1903, reviewing fifty years, estimated the rise in rent during that period at no less than 100 per cent.

Other evidence may be cited. The manager of the Great Eastern Railway told a recent Commission that the granting of an all-night train service to a certain suburb had resulted in an application for increased wages from his men based on the ground that rents had risen since the facilities were granted.

The fact is that, until the present land system is altered, all other efforts in philanthropy or social reform are largely wasted. You may give free breakfasts to school children; give old-age pensions to the aged; give cheap—or even free—tramway facilities; you mainly add to rent-paying capacity. Some small fraction may go to improve the standard of living, but the bulk will be registered in increased land values. This—the portion of rent due to monopoly land values—is indeed a tax on production of the worst kind—the kind that goes into private coffers, and the power of which grows with what it feeds on. It is a tariff imposed by no foreigner but imposed at home, working in an automatic ascending scale, cramping the very roots of industry, discouraging every effort to improve the condition of the people.

Remember that internal trade is a far greater factor in our national prosperity than external. With an over-sea trade greater than that of any other two nations, our home trade is yet five times greater still. An increase of 10 per cent. in exports may be more than discounted by a decrease of 2 per cent. in our consumption at home. This is the reason why exports are sometimes a quite fallacious test of national prosperity, and why we have recently had the conjunction of record Board of Trade figures with distress and want of employment at home. We can sell to the foreigner in spite of tariffs; we cannot sell to our neighbour at home because he cannot buy; his money has been wasted in riotous living by the Government he has placed in power; his output is stifled by a home-made tariff in its very beginning, long before he knows whether it will be with neighbour or with foreigner that he will exchange the products of his labour.

A thorough reform of the Land System would do more for trade by many fold than any conceivable expansion of exports.

Note how repressively the present system works both in town and country. *Take agriculture first.* Recently in Perthshire some men of enterprise started a fruit-growing industry. When they began the land was used at £1 an acre for grazing. They were permitted to introduce their improved industry at £2 an acre, only double the rent; but as soon as they were well established and wanted to extend, £10 an acre was exacted by way of penalty on undue enterprise.

The case of small holdings is well known. Four and five pounds an acre for one pound land is quite the usual demand when labour desires to till the soil, and by the spade to multiply twofold its produce. One owner may drain his lands and modernise his buildings; his tenant may fertilise the land and double its production. You tax both for their industry. Another owner, from want of means or want of will, may leave his land undrained, his buildings unrepaired; his tenant may impoverish the land. You reduce their taxation in proportion to their incapacity. What a mad system it is! Who can measure its evil effects on the whole body politic?

Take the case of the towns. When land in the neighbourhood of a town reaches its maximum value for agricultural use, its value at the most liberal estimate is 6*d.* per yard; but before it is allowed to be used for building it is usually held up to at least 3*s.* 6*d.* per yard; and the greater the need, the greater the price. Think what this means. If it came into use at its natural price, either each house could have seven times as much land with it, or a better house could be built for the same rent, or the same house could be provided for a lower rent.

That portion of the rent which represents artificial or monopoly value of land is a dead loss to the community. It is money which would otherwise go, and ought to go, in purchase of commodities produced by labour and requiring labour for their replacement. A thriving town, by the industry of its people and its municipal improvements carried out by means of its rates, creates a new value in the surrounding land. Its population expands, and it must buy back the value it has itself created. Every advance it makes creates a new barrier to its next advance.

Again, the present system penalises energy and encourages stagnation. Here are two owners. One develops his land by building houses or factories or shops according to the need. You rate him and tax him at once

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both on the land value and on the improvements. The other withholds his land, and you let him escape taxation altogether, and even to profit by his neighbour's energy. Observe how seriously this state of things affects the regularity of employment in the building and allied trades. Masons, bricklayers, slaters, plasterers, carpenters, plumbers, painters, and the host of unskilled labourers connected with these crafts have to face not only the usual seasonal variations, but a fluctuation of alternate "boom" and "slump" which is quite avoidable. The need for houses has to accumulate until its pressure can overleap the land-value barrier; then for a time there is expansion, but as soon as the pressure is relieved, these trades fall back into the trough of depression until demand can again surmount the artificial barrier. A proper system of taxation would change all this by removing the withholding power, and bring about a natural steady expansion.

It is not sufficiently realised how great proportion of the periodic distress, which calls out so much sympathy and so little economic thinking, is due solely to these alternations in the building trades, and the land system which causes them. A recent examination of the lists of a typical Labour Bureau showed that more than one half the cases were of this kind.

Thirdly, consider the position of mineral lands. Here we have a system of rents and royalties that would not be tolerated in any other country in the world. In a well-ordered State minerals would be the property of the State, but our system rests not on the private right to use, but on the private right to withhold from use. Hence the fact that in England before capital and labour can come together to use Nature's gifts to make steel, a private royalty of 5*s.* 6*d.* a ton must be paid, as compared with a public royalty in France of 11*d.*, and in Germany of 8½*d.* Under our conditions the amount of royalty is fixed so artificially high because of the power to withhold mineral lands from the market. It is what the trade can be made to pay, and is the measure of the margin which employers and workmen have, or ought to have, over foreign competition.

Tariffs would only add to royalties; land reform—taxing, not royalties, but mining rights—would free the trade and give it the benefits of its own improvements.

It is amusing to note how the great owners of royalties and ground rents congregate on Mr. Chamberlain's platform; they talk of Cobden's prophecies; one wonders if they ever read this one:

"I warn ministers and I warn landowners and the aristocracy of this country against forcing upon the attention of the middle and industrial classes the subject of taxation. For great as I believe the grievance of the protective system, mighty as I consider the fraud and injustice of the corn laws, I verily believe if you were to bring forward the history of taxation in this country for the last one hundred and fifty years you will find as black a record against the landowners as even in the corn law itself. I warn them against ripping up the subject of taxation. If they want another league at the death of this one, if they want another organisation and a motive, then let them force the middle and industrial classes to understand how they have been cheated, robbed, and bamboozled."

These are the evils of the system:

(1) *It checks production at its source.*

(2) *It keeps the producer at the minimum reward.*

(3) *It directly favours restriction of supply.*

(4) *It causes both unemployed rich and unemployed poor.*

What is the remedy? Not any great scheme of State Purchase with all its attendant officialism. That might easily be "out of the frying-pan into the fire." The expropriated owners could put up the rate of interest more easily than the rents; they would have been bought out at an artificial value; and the last state would be worse than the first. The people would be left to pay artificial interest on artificial values. What is wanted is to put Land, the primary element of production, on a Free Trade basis. Abolish its artificial monopoly. Let it come at Free Trade prices to those who can put it to the highest use. How can this be done? By taking taxes off production and improvements and placing them on the unimproved value of the land, whether it is used to its full value or not. This would destroy the withholding power, make owners compete for users, and reduce rent to its natural economic level.

The method might be very simple, and it might be accompanied by automatic registration of owners. If a man owns a dog or uses a gun he must once a year take out a licence and pay a tax. If a man claims the sole right over a million acres, or one acre, of God's earth, to permit or forbid human life upon it, to fix the terms on which other men may live and labour, why should not he be called upon to register his claim and deposit his tax for so great a privilege? Let him put his own valuation on his claim; and then, did the State

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need moorland for afforestation, or deer forest for crofters, or downs for manœuvres, or did the local authority need farm land for allotments, or accommodation land for workman's dwellings, the value on which tax had been paid would be quite enough for purchase. If a value were returned too low, the remedy would not be far to seek; for the register being open, any *bonâ fide* user willing to advance on the declared value could make an offer to the owner, and if the offer were refused, claim that the valuation should be raised at least to that level.

In New South Wales a tax on these lines has been levied for some years with the greatest benefit to the colony. Its amount is small, only one penny in the pound on the capital value, but yet it has been quite effective in breaking down speculative withholding of land, and in promoting the transfer of land to those who could use it best.

The year of its adoption was 1896, and here are some of the known results:

(*a*) In the preceding four years the number of unemployed registered with the Labour Bureau had been 18,600, 12,145, 13,575, 14,062. In the three years immediately following the figures fell to 6427, 4167, 3483.

(*b*) In 1897, within a year of the passing of the Act, the vast Peel River Estate, previously withheld from use, was cut up into farm lots and offered at auction.

(*c*) At the end of three years the area of land under cultivation had increased by 905,867 acres, no less than 50 per cent.

As advocates of Land Reform have always claimed, the social and economic effects of such a tax far transcend the merely financial gain.

It is difficult to state what a tax of one penny in the capital pound would produce in the United Kingdom. All our statistics refer to annual values, and therefore leave out of account the value of land withheld from use. Our rating valuations in the towns make no separation between site and building values, but, fortunately, in New York this has recently been done and the published figures show how great a portion of the valuation in a great city is due to site alone.

Working from the existing data, two careful estimates have recently been made—one by Mr. J. W. S. Callie in the *Financial Reform Almanack*, and the other by Mr. J. Dundas White, M.A., LL.D., in *Economic Ideals*. The figures arrived at for the annual value of the land (including mineral rents) in the United Kingdom are £200,000,000 and £180,000,000 respectively.

We may safely take £150,000,000 as a minimum estimate.

One penny in the pound on the capital value is the equivalent of 2*s.* 1*d.* in the pound on the annual value, and the revenue produced would therefore be £15,625,000. This would allow for a great remission of taxes that bear on production and are in restraint of trade. Justice could be done to the farmer without resort to doles, and existing taxes upon food could be swept away without the introduction of a "scientific tariff."

More important than the revenue produced would be the great stimulus to industry of every kind; there would be no honest unemployed until no land was capable of better than its existing use. Access to land would be gained freely without compulsion; a great home trade would be set in motion, of which at present we have no conception.

I have not spoken of primogeniture, entail, or laws of settlement; the abolition of these ties by itself would not do much good; but when the great chain is broken, the little cords will soon snap.

Nor have I travelled into history as I might have done, to show that the present pernicious land system is of no very ancient growth; that even to-day strict law recognises no absolute ownership as against the State; that it was by a mischance during the decay of feudalism that land was permitted to shift its obligations on to the shoulders of industry, and slip into the position of power without responsibility.

My desire has been to show that there is work for Free Traders to do beyond the defence of positions won two generations ago; that Free Trade is incomplete and one-sided until it includes freedom of production as well as freedom of exchange; that every principle which guided and inspired the great workers whose courage and energy abolished the Corn Laws calls upon us to go forward and complete their work.

There is still hunger in England caused by the laws. Let us remake Cobden's vow and say we will not rest until we alter those laws!

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THE TERRORS OF NIGHT AIR

A POPULAR FALLACY—TRUTH ABOUT THE OPEN BEDROOM WINDOW—THE SIN OF HARLEY STREET—STUFFY THEATRES AND CONCERT ROOMS—NIGHT AIR AND PLANTS—A NEW VENTILATION LAW WANTED

BY

C. W. SALEEBY, M.D.

WE mortals pass our lives at the bottom of a great ocean which we call the atmosphere. Only on one occasion have men risen higher than eight miles from the ocean floor towards its ethereal surface, some hundred miles overhead—and the venture nearly cost the two voyagers their lives. The meteorologist studies this atmospheric ocean as its tides and currents affect climate and weather; the astronomer and physicist teach us that, were the earth somewhat smaller, this envelope would be dispersed, gravitation failing to retain it—and life could not be. The biologist knows that he and his study are alike dependent on the existence of this ocean at the bottom of which men crawl; but perhaps it is the physician who has most of importance to say on this subject.

The description of the atmosphere as an ocean is meant to serve a further purpose than that of merely attracting the reader's attention. I want him to realise that air is a ponderable, actual entity; that though we talk of "trifles light as air," yet air has weight and *inertia*. It does not move save when some force is applied to it: any more than does a sideboard or a haystack. When people begin to realise this perfectly obvious fact, they may begin to appreciate the need for and the nature of the problem of ventilation, which is, at bottom, a question of moving masses of air from one place to another. It is for this reason that I specially welcome the recent "turns" with liquid air at the music-halls, incidentally teaching the pleasure-seeker that air, like every other gas or mixture of gases, is *matter*, which can no more move about on its own account than can any other form of matter, solid, liquid, or gaseous.

Now that we understand what the problem of ventilation really is, I propose to give the foremost place to the most important and most neglected form of ventilation—the ventilation of the bedrooms in which we spend a third, more or less, of our lives. The ventilation of the theatre and the public hall must obviously be treated as of much less importance.

And here I have the particularly grateful task of exposing a superstition. It is widely believed, alike in quarters high and low, that there is something specially noxious or undesirable about *night air*. On the contrary, night air, though of course cooler than day air, is purer and healthier. Lessened traffic means less dust or gross impurity: lessened combustion means a less proportion of carbonic acid in night air. (Similarly one may note that air after rain is purer than before, since the rain washes the air, each drop removing myriads or rather millions of solid particles from it.) Whence, then, a superstition which is directly opposed to the facts? It must have some basis, and indeed, the explanation is of uncommon interest. Night air owes its bad reputation to the fact that the female mosquito feeds at night! That terrible disease, malaria (which causes more illness, though tuberculosis causes more deaths, than any other) is not due, as the name suggests, to *bad air*, but to invasion of the blood by a parasite which passes part of its life-cycle in the body of the mosquito. Every case of malaria (or perhaps, I should say, nearly every case) is due to infection by the parasite as the result of the bite of an infected mosquito. It is only the female that bites, the male having no lower jaw. It is at night that she feeds: hence the reputation of night air. Where the *Anopheles* mosquito does not exist, as in this country, the special purity of night air has no countervailing disadvantages in the shape of any risk of malaria. But in other lands it is plain that the prejudice against night air, though misdirected, has every excuse for its existence.

Let us now inquire why every one should sleep with his bedroom window open. It is

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high time that the fact be insisted upon: for the tubercle bacillus, which claims a victim in this country every nine minutes or so, year in, year out, has no ally like impure air; and a census of bedroom windows at night in York has shown how utterly inadequate is the public appreciation of the facts; whilst a similar census of Harley Street windows has shown that even the doctors do not excel in practising what they preach.

It is, then, the fact that not even the spacious bedrooms of a palace contain enough air to last unchanged throughout an entire night, and provide one occupant with an atmosphere above the limit of physiological impurity in the morning. This may be incredible because neither the public nor the law yet recognises the difference between *cubic feet of space* and *cubic feet of air*. This is well shown by the recent experience of the Royal Commission on Factories, which repeatedly found air of dangerous impurity in work-places which provided far more than the statutory number of cubic feet of space per occupant. Neither in bedrooms nor anywhere else is it practicable to provide an adequate number of cubic feet of space to suffice without ventilation: whereas very few cubic feet of *space* will suffice if ventilation ensures that the cubic feet of *air* supplied are adequate. The value of space, indeed, is merely to make the problem of ventilation easy, obviating the difficulty created by draughts.

However big your bedroom, then, you must have more cubic feet of air during the night than those originally contained in the room when you go to bed, and for this purpose you must have the window open. Similarly, the chimney must always be open; to put the shutter down when the fire is not in use is to deprive yourself of a most valuable outlet. There is no good reason, indeed, why such shutters should be provided at all. And here I may note the high ventilating value of a fire, which causes air to rush up the chimney at an average rate of some three feet per second. Fresh air must pour in at every chink to replace the air withdrawn, and thus ventilation, which is the moving of a certain kind of matter, is attained.

I have here discussed a simple subject, general attention to which would, beyond all question, immediately and markedly lower the death-rate. And what other sanative agent is known or can be cheaper than the open bedroom window? Need I say that the obvious place to open your windows is at the top? Before leaving this subject I must refer to the influence of plants and living flowers on the air of rooms. Under the influence of sunlight plants decompose more carbonic acid than they form. (Form some they must, since every living thing must breathe.) But green plants, in sunlight, decompose carbonic acid, keeping the carbon and returning free oxygen to the air. In daylight, then, plants are equivalent to so much extra ventilation (without risk of draughts), but at night they are so many more consumers and vitiators of the air. They should thus always be removed at night from the sick-room which they cheered and benefited by day.

In discussing the ventilation of our public places, it is hard to find cause for anything but strong language. Curiously enough, perhaps the best ventilated place of amusement in London was one which has lately been exhibiting liquid air. As each such exhibition is a most efficient means of ventilation, it was almost a pity that it should be given in perhaps the one place where it was superfluous. But once we leave the Hippodrome and some of the music-halls, where the expensive but admirable *plenum* system is used,* there is a sorry tale to tell. I went to the new Coliseum expecting to find it perfect in this matter, but it is very far indeed from being so. There was money to spare for every conceivable thing but ventilation. The theatres, generally speaking, are lamentable. The churches are as bad. The Albert Hall I have often found almost unbearable; well illustrating the difference between cubic feet of space and cubic feet of air. What good word can even one who spends most of his spare time there say of the ventilation of the Queen's Hall? As to the most distinguished scientific auditorium in London, not a hundred miles from Albemarle Street, I have heard a distinguished professor discourse there on respiration, and the entry of gaseous impurity into the blood, in an atmosphere which rendered any illustration of the point more than superfluous. There is, also, in Wigmore Street, a superb concert hall, built quite recently, which is lamentable in this regard. Would that all architects might have lessons in elementary hygiene, to enable them to realise the amount of work which their predecessors have superfluously given to the medical profession.

But it is not decent to discuss the places

* By which good air is forced into a building, so as to keep it *plenum* or full; as distinguished from the *vacuum* system, by which the bad air is—supposed to be—sucked out!

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where men go voluntarily for an hour or two, if one is to forget the countless shops and offices where tuberculosis is bred in the unfortunates who have to spend the greater part of their waking hours in an impure atmosphere. We must have—and some day, when domestic legislation has a chance, and men turn them again to the victories of peace, we shall have —a law which does not dictate futile figures as to amount of space, but says to every employer and caterer for the public amusement, "The air you provide is at any time liable to be analysed; and if it be found persistently to contain more than (say) six parts of carbonic acid in ten thousand, you will be punished."

More than it has yet had time to do for the consumptive, the open-air method of treatment should do for the general public in preaching the gospel of fresh air. Unfortunately, it is so easy to become accustomed to air which is not fresh, that men will ignore that which they cannot afford to ignore. If carbonic acid had a strong and offensive odour, it would be no worse than it is, but men would not tolerate it as they do. I will cease from troubling by quotation of an incident which instructed me. A consumptive patient, who had spent all his time outside on the balcony of a ward of a certain hospital, was taken into the ward in order to have his chest carefully examined, to see whether any signs of active disease remained. He had not been indoors for some months. The hospital boasts that it allows its patients more cubic feet of space than any other in Great Britain; and its ventilation system is regarded as perfect. But that patient had not spent half an hour in the ward before he complained that it was "stuffy." I wish the reader could enter that airy ward, far more airy than any room, I may guess, in which he spends his days; and realise the difference between our vitiated standards and that of this patient, who had experimentally learnt what pure air is, and who scandalised a host of officials by calling their belauded ward "stuffy." What would he have said of a bedroom of average size in which a man has spent all night with closed window? Ugh!

WILL IT PAY TO ELECTRIFY?

WHAT OUR RAILWAYS HAVE TO CONSIDER

THE NEW MOTIVE POWER COMING INTO FAVOUR—COMPARISONS BETWEEN STEAM AND ELECTRICITY—SOME WORKING RESULTS, AND HOW THEY PROVE THE ECONOMY OF ELECTRIC TRACTION

BY

H. G. ARCHER

THE great question agitating the railway world at the present moment is, Will it pay to electrify? Before any comprehensive change from the present system of motive power is made the result must promise either a more economical method of transportation, or the provision of such additional facilities that the volume of traffic will be increased. In short, the crux of the problem is the production of an increased net revenue: will electrification effect that? Theoretically, certain comparisons suggest themselves when seeking to analyse the working of a steam-operated railway and that of a line employing electric traction, with a view to ascertaining the *pros* and *cons* of financial success.

In recent issues of the *North American Review* the points where comparisons should be made were very ably set forth by Mr. C. L. De Muralt and Mr. Cornelius Vanderbilt, and we cannot do better than enumerate them, and furnish a précis of the deductions which those experts arrived at.

The first point to be considered is the cost of fuel, and it is conceded that this is equal on any given road for both systems. The lay reader must be reminded of the fact that since it needs some prime mover to drive it the discovery of the dynamo-electrical machine

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has not made any direct addition to our sources of energy. The chemical battery, the oil-engine, the gas-engine, and the steam-engine all derive their energy from nature. The only case in which the dynamo ranks with these is when it is driven by water-power. Where water-power is available, it is impossible to compare the cost of such power as a "fuel" to the cost of the actual coal or oil, but its cost after conversion to electricity could be compared to the cost of electricity generated by means of coal or oil, boilers, engines, and dynamos. Secondly, in what proportion does the amount of work realised bear to the initial amount of work put into the machine?

Now the steam locomotive is a direct-acting machine, *i.e.*, it obtains the power at the driving wheels by means of a single conversion of energy, whereas the electrical system of propulsion must employ a double or multiple conversion of energy before the power is obtained at the motor wheels. It is an axiom of physics that in any conversion of energy a loss must ensue, and, therefore, if the first conversion, viz., that from coal to steam, is equal in both cases, there will be a lower total efficiency in the case of the double or multiple than with the single conversion. Nevertheless, it so happens that in the first conversion the efficiency of the systems under comparison is not equal. The locomotive efficiency is lower than that obtained from stationary boilers and engines. The higher efficiency of the latter is due to the fact that it is possible to use far larger units, that the engines are condensing, that it is not necessary to force the boilers to the same extent as the boilers of locomotives, and that there is a smaller loss in the mechanism of the engine itself. Therefore, allowing for the initial outlay for installing the system of electrical distribution, and also for the losses of energy, which depend upon the distance between power houses and sub-stations, the cost of the electric locomotive should be no higher than that of the steam.

A third point inviting comparisons is concerned with the relative cost of operation, and expenses incurred under this heading may be classified as follows: (1) cost of motive power; (2) cost of water-supply; and (3) cost of oil, waste, and other supplies.

(1) The weight of an electric locomotive required to haul a given load is much less than that of a steam locomotive of equal capacity, and the reduction in train weight represents just so much saved in motive power. The steam locomotive carries a great deal of dead weight, in the form of a tender for the fuel and water, and as all the power is concentrated in the engine the weight on the driving wheels — available for adhesion — is limited. The electric locomotive has no tender, and when the multiple unit system of train control is employed, the locomotive can be combined with the cars, by placing a motor on one or more axles of these cars, and so utilising nearly the whole weight of the train for traction. The fuel consumption of a steam locomotive varies according to the skill of the driver; but it is a fallacy to suppose that the skill or otherwise of the motor-man does not affect the efficiency of the electrical machine. The skill of the motor-man has a very great bearing upon the total efficiency, quite as much as in the case of a steam-engine. There is much art in the correct use of the brakes and knowing when to cut the current off and allow the train to run by its own inertia. The proper way to handle a controller is only learnt by experience, and a novice is very apt to waste more power in its resistances than is necessary. This latter point is one in which the single-phase system with induction potential control scores. There are no resistances and so every speed is attained economically. The electric train only draws energy whilst doing work, unlike its rival, which is doing so all the time it is in service.

(2) Electric traction entirely dispenses with the need for a water-supply along the line.

(3) Electric traction reduces the cost of oil, waste, and other supplies. There are twenty as many parts on a steam locomotive which require lubrication as on an electric locomotive, and no packing is required for motors.

A fourth point is the question of the permanent way. Electric traction must increase this charge by reason of the additional cost of maintaining the surface or overhead conductors, the extra complication caused by the conductors at switches and cross-overs, and the necessity of providing efficient insulation by either bonding the running rails or installing return conductors.

On the other hand, electric traction saves something in the wear and tear of the track. The steam locomotive, owing to the reciprocating motion of pistons and connecting rods, is an unbalanced machine, and exerts a hammer-like effect upon the rails. The electric locomotive has no reciprocating motion in the driving machinery, hence it does not pound the rails.

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Electric traction in the form of railways has been found suitable to the following conditions of transit—urban, suburban, tunnel work of heavy main-line traffic in cities, and mountain.

Where both urban and suburban traffic are concerned, it has already been demonstrated that, even at this early stage of its development electric traction is doing much towards solving the complex transit problems in which steam has failed to give complete satisfaction. The figures given in the next column prove that in such cases, where the number of units operated between terminal points is very large, the resulting economy will soon defray the combined cost of power stations, and of the electrical track and rolling-stock equipment. The main advantage of electric traction on urban and suburban lines is that it furnishes a higher *vitesse commerciale*, which is mainly achieved by the high rates of acceleration that can be realised with it. It is evident that in short distance runs, if the rates of acceleration can be increased, the average speed of the train service is increased, and the number of trains, hence the carrying capacity of the line, can be augmented. Another feature reveals itself, namely, that the increased frequency, rapidity, and (in the case of tunnel lines especially) cleanliness of the service creates a considerable additional traffic, either entirely new, or filched from other less comfortable or convenient modes of traffic. At the same time, working expenses are decreased. Until the Manhattan Elevated Railway of New York substituted electricity for steam throughout its system of nearly forty miles, comparisons of any sort were difficult. The official figures recently published in the *Times* are of the greatest interest and importance, inasmuch as they furnish a comparison of operating expenses for a complete year of operation by steam, namely, in 1901, and of those of the first year of operation entirely by electricity, namely, in 1904, while they exclude the intervening period of operation partly by steam and partly by electricity. The results are as follows :

	Electric. 1904.	Steam. 1901.	Per car mile. 1904.	Per car mile. 1901.
	Cents.	Cents.	Cents.	Cents.
Maintenance of ways and structures	646,163.78	406,739.72	.01,047	.00,927
Maintenance of equipment and power-plant . . .	818,372.84	571,851.56	.01,325	.01,304
Power supply and connecting transportation .	4,013,979.69	3,967,516.11	.06,501	.09,346
General expenses . . .	367,534.78	307,122.16	.00,595	.00,770
Total operating expenses .	5,846,051.09	5,253,229.55	.09,468	.12,347

It will be seen from this that the total operating expenses per car mile have decreased about 2½ cents between those two years, or that it has been reduced from a trifle less than 6*d.* to 4¾*d.* Again, the point must be emphasised that although not a yard of new track has been laid or a new traffic district penetrated, the system being exactly the same as that which for twenty years previously had been operated by steam, yet the number of passengers carried has increased between 1901 and 1904 from 248,587,022 to 286,634,195, an increase in twelve months of 40,047,173. In the same time the gross earnings have risen from 12,208,337.32 cents to 14,187,685.60 cents, an increase of nearly 2,000,000 cents, while the increase in net earnings due to electrification is 1,594,090.91 cents. (say £3320).

It is said that the results of the electrification of the elevated railways of Chicago have proved equally satisfactory. In 1898 an electric service was brought into full operation on the South Side Elevated Railroad. The operating expenses with steam averaged between 15½ and 16 cents per car mile, with electricity they averaged 8½ cents per car mile. The number of passengers carried has increased by ten millions since 1898, and the reorganised company have succeeded in wiping out all their liabilities, paid high dividends, and are now understood to have accumulated a surplus of one million dollars.

The Mersey Railway was the first English line to substitute electricity for steam. The conditions here are somewhat peculiar. The railway has an aggregate length of four miles seven chains, of which the tunnel under the river accounts for one mile nine hundred and forty yards. After the opening of the line in 1886 it was, for a time, largely patronised, but the development of the traffic was hindered by the discomfort and inconvenience consequent upon working with steam locomotives. The stations and tunnel became loaded with noxious fumes, and, together with the rolling-stock, grew more grimy and less attractive. In July 1901, a contract was concluded with the British Westinghouse Company for the complete electrical equipment of the railway, and the work of conversion was carried out without the slightest interruption to traffic. The railway ceased to be worked by steam at midnight on May 2, 1903, and on the following morning a service of electrical trains was inaugurated. The new service, however, had hardly got into its full stride by the early part of the period covered by the

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accounts for the latter half year of 1903, namely :

	1902.	1903.
Train mileage for half year	155,039	401,046
Passengers carried (excluding season-ticket holders)	2,844,708	4,153,777
Total receipts	£29,470	£37,357
Total working expenses (excluding exceptional charges)	£21,992	£28,203
Exceptional charges	£6,089	£4,237
Percentage of exceptional charges	20.66	11.34
Percentage of working expenses	74.63	75.50

The chairman of the company explained that the above figures must not be accepted as a complete indication of what the results of the change would be. The working expenses, he admitted, were not satisfactory, but it must be remembered that they were now giving a much better service, and in comparing costs all the comparisons were in favour of electricity, thus :

	Steam service. Pence per train mile.	Electric service. Pence per train mile.
Maintenance of permanent way	3.9	1.6
Loco. and generating power	11.3	5.2
Traffic expenses	13.5	7.3
Cost of ventilation	3.4	0.2
Cost of pumping	4.85	1.5
Total working expenses	41.2	18.2

At the last half-yearly meeting of the shareholders of the Mersey Railway Company, the chairman said that they had now got to a stage in the electrical work of the company when practically the only consideration which the shareholders had to deal with was the question of the results of operating and the cost of bringing them about. The accounts for the half-year showed a substantial improvement. The train mileage had been 411,683 as against 218,308 in the corresponding half-year in 1903. The number of passengers carried, excluding season tickets, had been 4,500,000 as against 3,201,621, showing an increase of 1,300,000, or something approaching 40 per cent. on the number of passengers travelling. The receipts from passengers, excluding season tickets, had increased from £26,136 to £33,715, being equal to an increase of 29 per cent., while the total increase from all sources on the half-year had been £8640, or equal to nearly 25 per cent. The working expenses, however, had amounted to £33,591, as against £32,061 in 1903, which was taking into account the exceptional charges for pumping and ventilation. These figures he contended conclusively established the extraordinary superiority of electrical traction over steam propulsion in dealing with their railway. They could, in fact, deal with double the traffic they had at present, and that could be done at a cost of 1*s.* 7½*d.* per train mile.

The North Eastern Railway Company are abandoning steam power on their lines extending from Newcastle Central to New Bridge Street *viâ* Tynemouth, including the Riverside branch, the mileage of which comprises two miles of four lines of way, thirty-five miles of double lines of way, and four miles of single line of way. On March 29 last the company instituted a regular service of electric trains between Newcastle Central and Benton, a distance of four miles, and the new system of traction is being gradually extended. The whole of the electrical equipment of the North Eastern lines has been carried out by the British Thomson-Houston Company of Rugby.

On March 23 last, the electrification of the Liverpool, Southport, and Crossens section of the Lancashire and Yorkshire Railway was inaugurated with a trial electric train trip, since when the service of steam-driven trains has been gradually withdrawn. The electrified section is 21½ miles in length, and forms the largest scheme of railway electrification of a main line thus far carried out in this country. The electrical equipment was supplied and installed by Messrs. Dick, Kerr and Company, Limited.

Neither the Lancashire and Yorkshire nor the North Eastern Company are yet in a position to adduce any figures as to the exact cost in comparison with steam working. With the Lancashire and Yorkshire the increase in traffic far exceeded the company's most sanguine expectations. In the month of December, when the dense fogs occurred, they had an increase of 104,000 passengers on that section. The North Eastern Company carried on their electrified branches during the last half-year of 1904 675,000 more passengers than in the corresponding half-year of 1903.

However, an examination of those figures furnished by the Manhattan Elevated Railroad of New York and the Mersey Railway will not fail to encourage the advocates of electric traction, and particularly those enterprising capitalists who are now spending many millions of pounds in the electrification of the Metropolitan-District lines and in the construction of new electrical "tube" railways. We have not given the results of the operation of the various tube lines already at work. As the latter have been electrically operated throughout and the conditions under which they are worked are of a peculiar character, their evidence is not to the point. The results achieved by electrically operated mountain railways also

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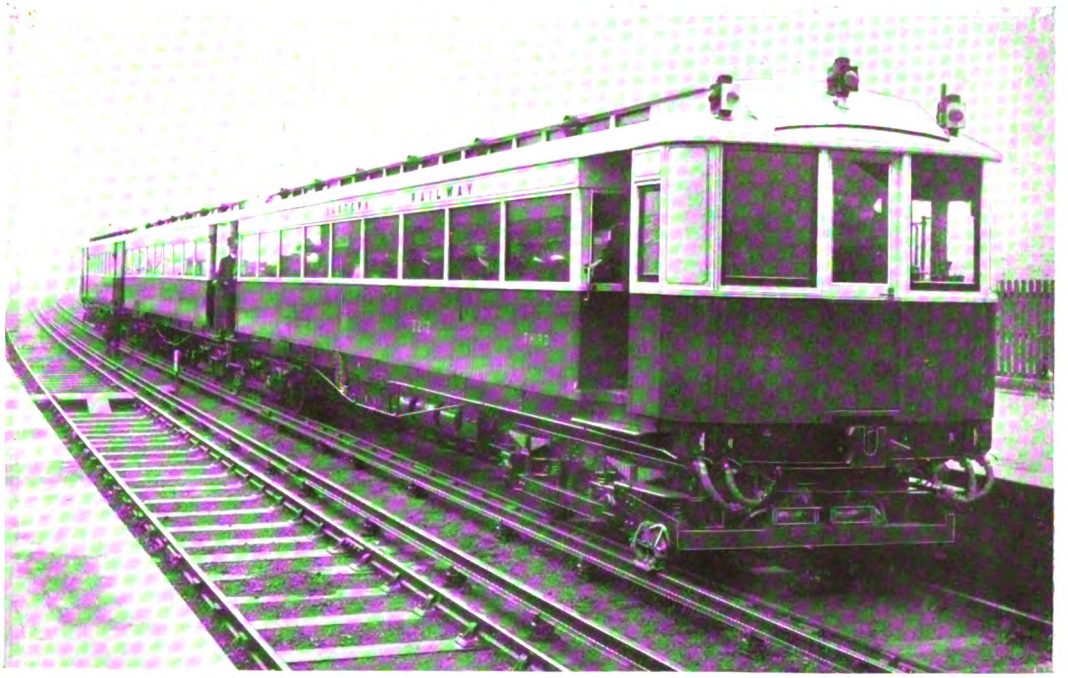

AN ELECTRIC TRAIN ON THE NORTH EASTERN, BETWEEN NEWCASTLE AND TYNEMOUTH

AN ELECTRIC EXPRESS APPROACHING TUSHFIELD STATION AT 50 MILES AN HOUR

The Lancashire and Yorkshire Electrified Railway

are excluded, as these are purely summer tourist lines.

In this country there is as yet no instance of electric traction having been substituted for steam for the tunnel work of heavy main lines in cities, but on the "Baltimore Belt" Railroad, electric locomotives, weighing ninety-five tons, have been found to give increased economy and efficiency in hauling passenger trains through a long tunnel on a grade of 1 in 125, at a speed of fifty miles per hour.

For main-line and express service between great cities, electric traction is still in an experimental state, and although highly important developments may be expected before long, the *pros* and *cons* of financial success must remain for a time more or less theoretical. The high-tension, overhead wire,

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single-phase system of the British Westinghouse Co. appears to offer the best solution to the problem; and the general consensus of engineering opinion is decidedly in its favour. It is claimed, and apparently upon good foundation, that this system renders the economical electrification of even the longest lines thoroughly possible; and we shall not have long to wait before tangible working results will be forthcoming from American railways using the Westinghouse single-phase equipment.

The London, Brighton and South Coast Railway Company have just decided to experiment with electric traction between Battersea and Peckham, and have adopted the single-phase alternating-current system in preference to the "third" rail direct current.

Dr. Reichel, whose graphic account of the famous run from Berlin to Zossen at a speed of 130.4 miles per hour, was published in the English newspapers, has given rather interesting comparisons between steam and electricity, where the costs of main-line operation are concerned, from the German standpoint.

A steam train, consisting of a locomotive and five cars, weighs 330,000 kilogrammes, contains 168 seats, and uses 1400 horse-power at full speed; the electric train, consisting of one motor-car, and four trailers, weighs 260,000 kilogrammes, has 180 seats, and uses 1000 horse-power. The initial cost of both trains is practically the same, being about 400,000 marks. The operating cost for simply moving the train is fifty-one pfennigs ($6\frac{1}{4}d.$) for 100 seat kilometres, operating with steam, and $49\frac{1}{2}$ pfennigs ($5\frac{3}{8}d.$) using electricity. Applying the calculation to the proposed electrification of the 150 kilometre or ninety-four mile main line between Berlin and Leipzig, he gets the following conclusions:

On this line thirty-six trains a day run every hour in both directions, so that if 40 per cent. of the seats are occupied (the trailers are put on when necessary) about 2500 passengers are accommodated. Figuring the fare per kilometre as six pfennigs ($\frac{3}{4}d.$), which is the present second-class fare, this would give a daily income of 22,500 marks (£1125).

The operating expenses, considering transportation only, are about 5000 marks daily (£250). Adding to this the other operating expenses, particularly for employees, maintenance of way, stations, management, &c., 7600 marks daily, this would make the daily operating expense 12,600 marks. This leaves 9900 marks for interest on the original capital, which in one year would be 3,600,000 marks. The latter would give 4 per cent. interest on 90,000,000 marks. The cost per kilometre in this case would be about 600,000 marks.

SHOWING THE ARRANGEMENT OF THE THIRD AND FOURTH RAILS AND THE GUARDING OF THE FORMER

Electrified Mersey Railway (British Westinghouse Equipment)

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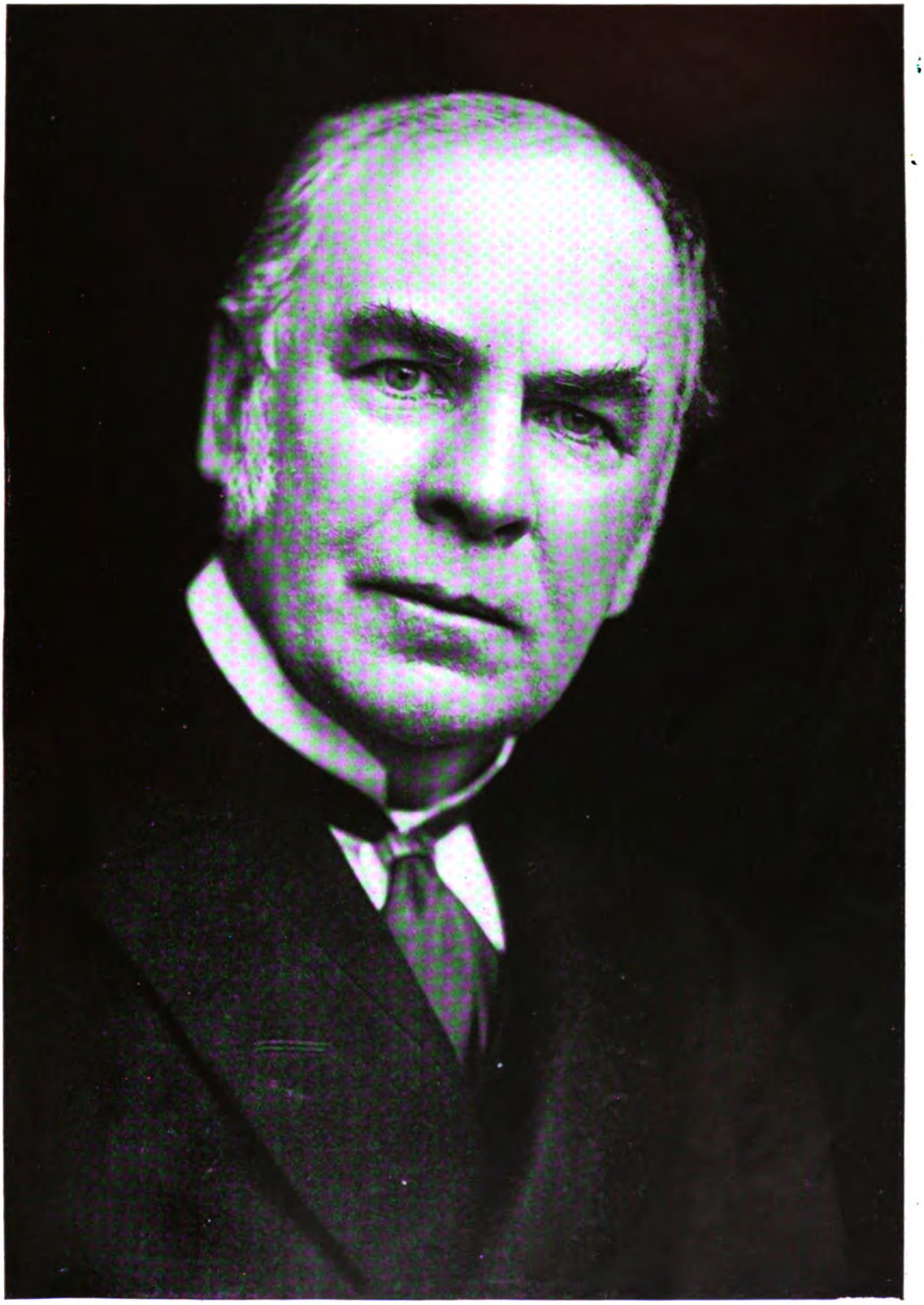

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MR. ROBERT WILLIAM PERKS, J.P., M.P.

UNDER WHOSE CHAIRMANSHIP THE METROPOLITAN DISTRICT RAILWAY COMPANY HAS ELECTRIFIED ITS SYSTEM AT A COST OF £1,200,000

A photograph specially taken for THE WORLD'S WORK AND PLAY

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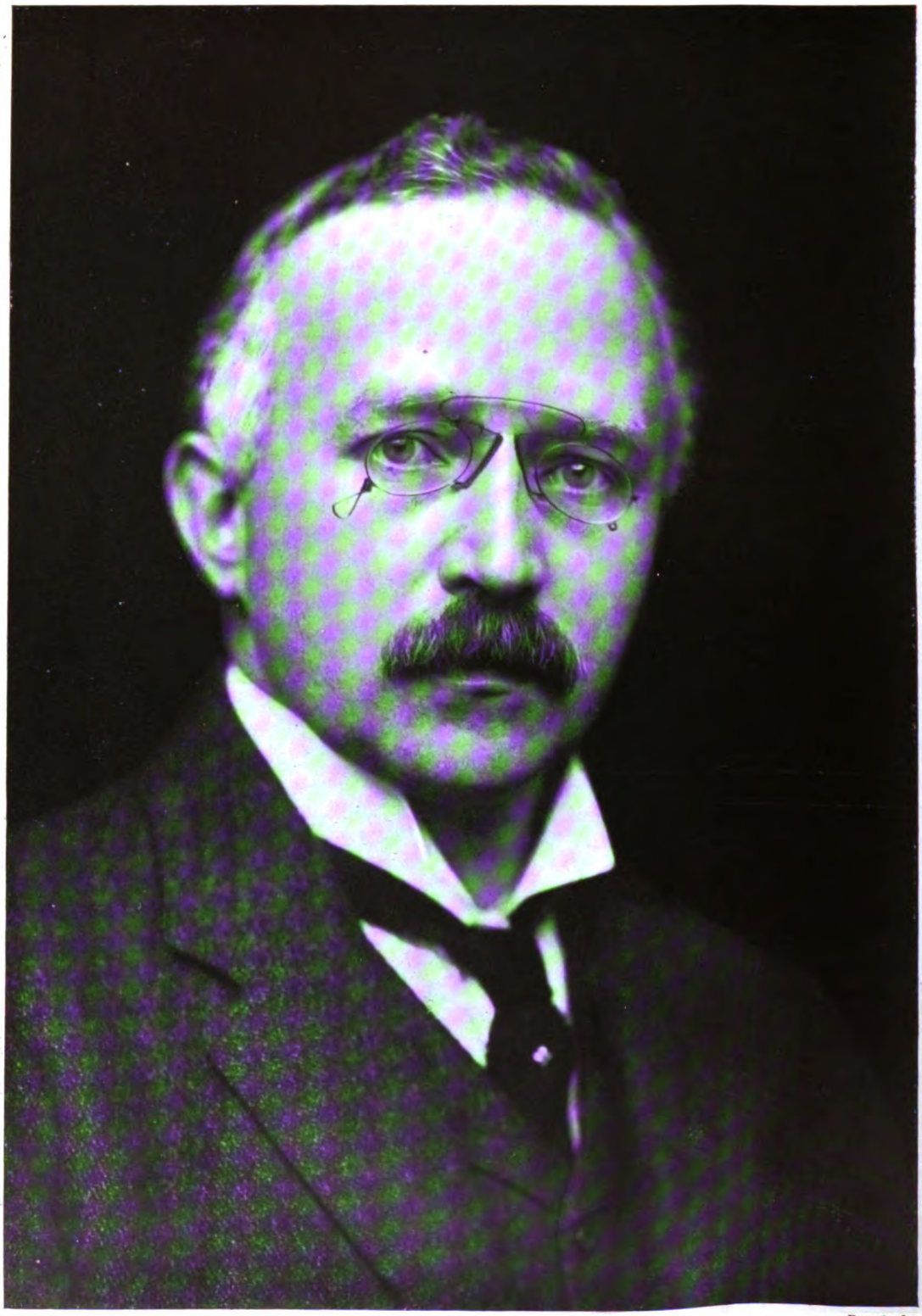

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MR. J. H. WHITLEY, M.P.

WHO WRITES IN THIS NUMBER UPON THE NEED FOR REFORMING THE TAXATION OF LAND

A photograph specially taken for THE WORLD'S WORK AND PLAY

See page 357.

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JOHN W. ALEXANDER:

AN AMERICAN ARTIST AND HIS MOTIVE

THE PAINTER OF IDEALISED SENTIMENT THROUGH PORTRAITS OF WOMEN IN POSES—SOME EXAMPLES OF HIS WORK

BY

CHARLES H. CAFFIN

IT is as a painter of portraits, of a series of mural decorations, and of many figure pictures with a distinctly decorative purpose, that Mr. John W. Alexander has attained distinction.

Originality of feeling and a lively sensitiveness are conspicuous features of his work. They are the qualities in himself which first made him an artist and directed him through the early years of his study. Starting from his home in Allegheny City, Pa., where he was born in 1856, he made his way to Paris, only to leave it in a few days for Munich. There he entered the drawing-class at the Academy, but he escaped the cut-and-dried methods then prevailing, because his teacher, Benczur, encouraged him to follow the bent of his own inclinations. This gave him a confidence in himself, and in his point of view that has been of great benefit to him. But his lot at that time corresponded with that of many other students. He was dependent on his own exertions, and living at Munich was beyond his means. Accordingly, after a few months he went to the little village of Poliez, in Upper Bavaria, where he enjoyed the companionship of many Americans, among them Currier, Walter Shirlaw, and Frank Duveneck. The influence of Mr. Duveneck was especially valuable. With him he first took up the practice of painting, and for two years worked under his supervision.

Incidentally one may remark how singularly unselfish and self-effacing Duveneck's career has been. Ripe in achievement, with promise of yet more, he abandoned personal ambition; and the record that he has since made is one of help and encouragement to others. In this capacity his subsequent life has been spent as a teacher at the Cincinnati School of Art, nd many are the students who acknowledge their indebtedness to the high artistic ideals and practical help that he has imparted.

Some time after Mr. Alexander had left Munich, he was invited to submit drawings to the competition at the Academy, and he gained the Prize Medal. The scene of his work now shifted to Paris. He entered no school, but he continued to be an indefatigable student; and soon he began to obtain

MISS DOROTHY ROOSEVELT

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"THE BLUE BOWL"

notice among the younger artists who exhibited at the Champs de Mars. Meanwhile he maintained some affiliation with Munich; for, when the secession, or revolt, of the younger artists from the dry-as-dust rigour of the Academical body was started, he was invited to become a member. Later on he was elected a corresponding member of the still more

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"PANDORA"

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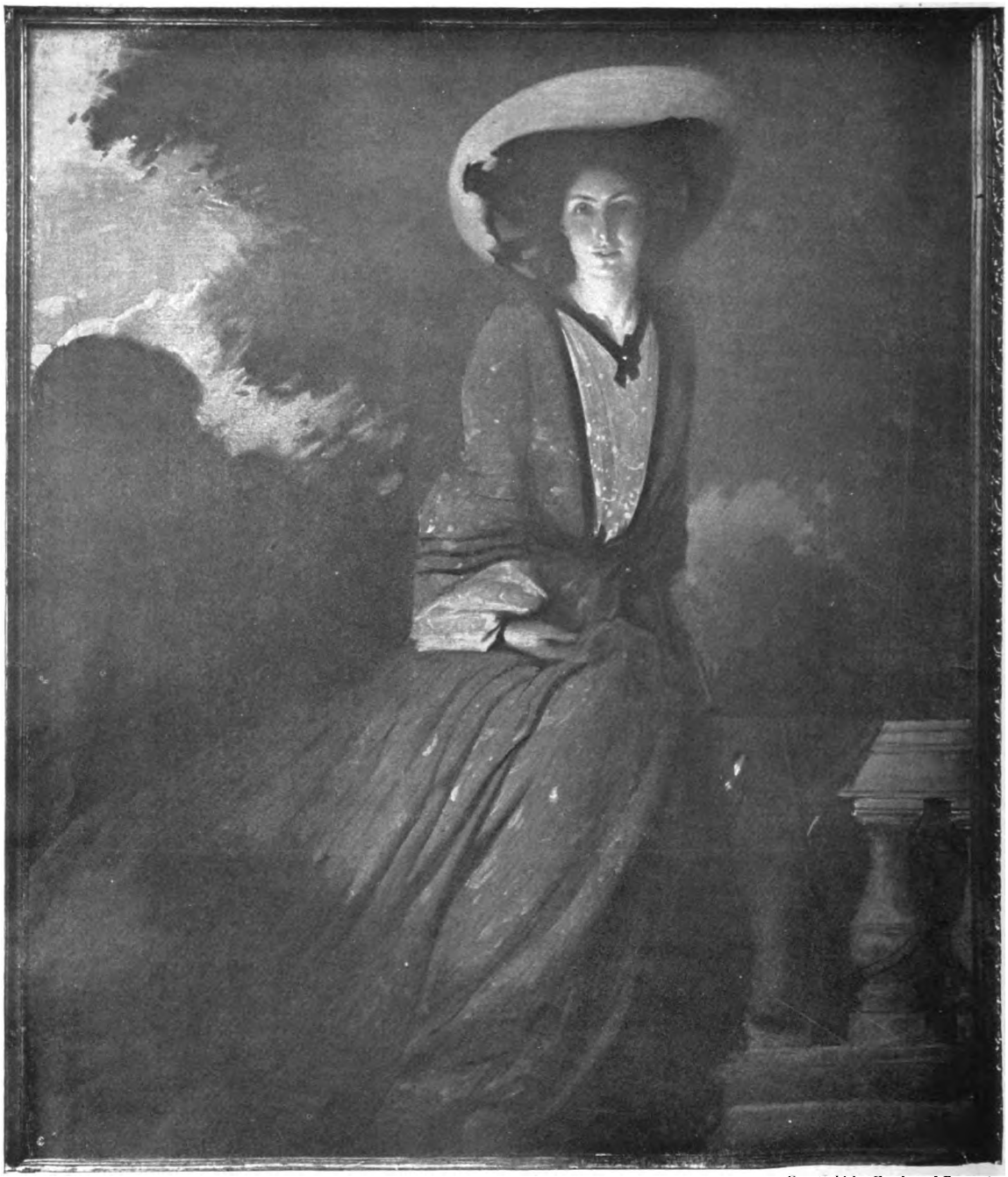

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PORTRAIT OF MRS. ALEXANDER

important secession in Vienna. It might be inferred, therefore, that he was an artist of the aggressive kind; but nothing could be further from the truth. He is, in fact, a singularly uncombative person, continually busy with his own work and thoroughly absorbed in it. But he is modern to the finger-tips; his work is racy of the modern feeling and independence, so that he has been in sympathy with every movement making for artistic liberty, and his identification with them has been only natural.

During a long stay in Paris, from which he returned only a year or two ago, he was inti-

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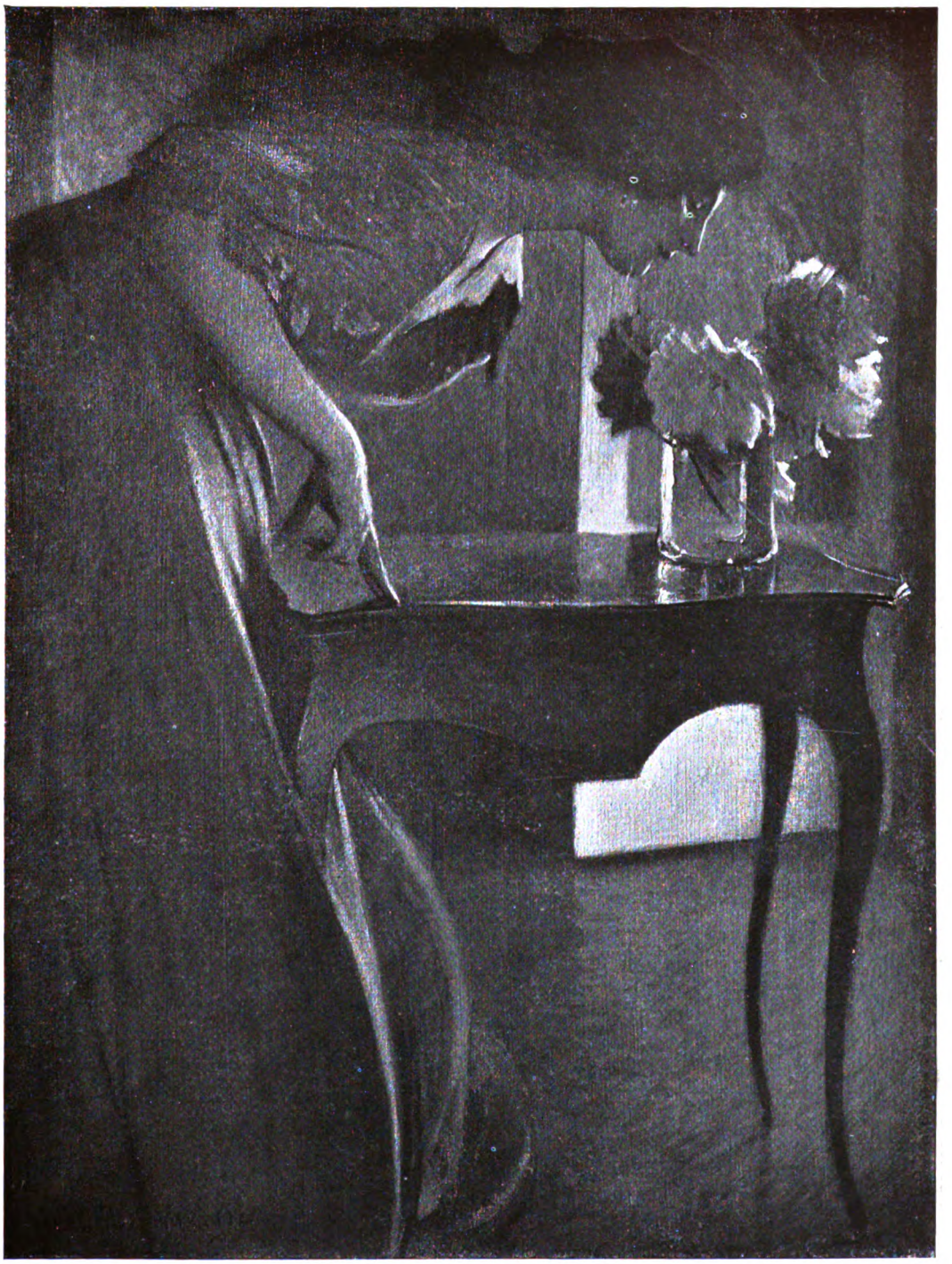

"FLOWERS"

mate with many of the leading spirits in modern French art, and among them with Rodin. He painted a portrait of Rodin which was a conspicuous feature of the American section in the Paris Exposition of 1900. It is a work of close sympathetic observation, indicative of personal admiration of the subject. Indeed, one may detect the influence of Rodin in Alexander's

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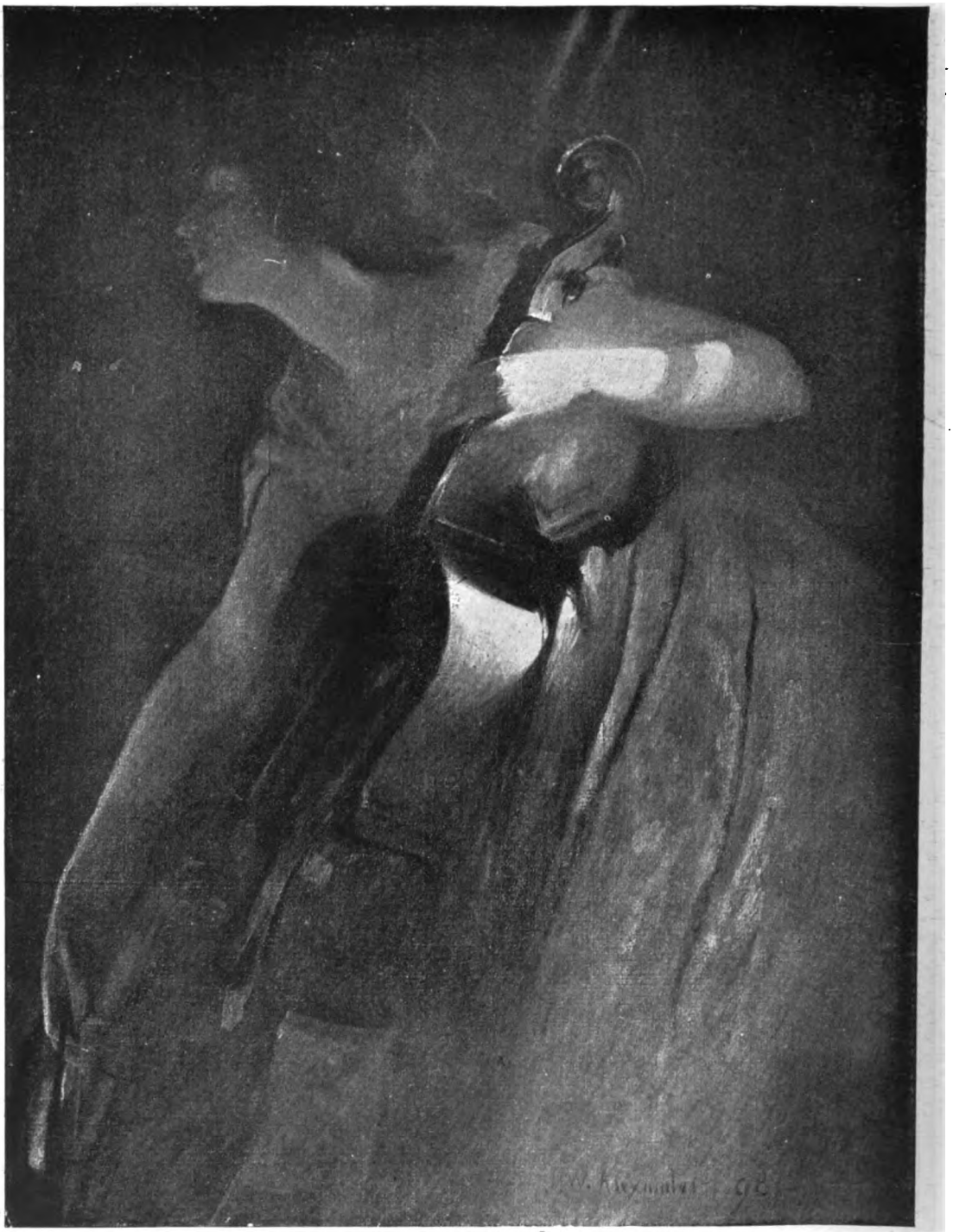

"A RAY OF SUNLIGHT"

work, particularly in the expressiveness of gesture and movement that he imparts to his figures.

Of course, expression of gesture and movement is the aim of many modern artists, especially portrait painters; it is, in fact, a characteristic of the modern artistic ideal. But the marvel of Rodin's work is that, how-

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PORTRAIT OF MRS. LEDYARD BLAIR

ever extreme may be the intensity of emotion embodied in gesture, however unusual the movement of the body, the figure yet has a suggestion of repose, a plastic immobility. He preserves always that subtle border-line between immobility and life, between the ideal and the real. Apparently he maintains this poise by the nicest calculations of

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PORTRAIT OF MRS. HERMAN DURYEA

what is essential in a gesture or a movement, and then by a severe restraint which avoids an emphasis even of the essential.

Now the characteristic of all Alexander's best work is a mingling of reticence with spirit. He loves to seize the fugitive gesture or expression which must be taken by surprise. This is easier to secure at the outset of a picture than to retain through any long process of elaboration. He therefore reduces the amount of work upon the canvas to a minimum. The pigment is applied thinly, so that the canvas

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is visible through it; and the canvas is coarse-grained, with the result that its unevenness of surface entices the reflections and refractions of light, which gives animation to the stretches of flat tints.

There may be a disadvantage inherent in this method. Where the means employed are so slight, the least deviation from the original appearance may frustrate the artist's purpose. For example, the gradual sinking of the pigment into the pores of the canvas, a process which will continue for some time after the completion of a picture, may reduce the sprightliness of the colour and of the figure's gesture. Just such a thing seems to have happened in the case of Alexander's portrait of Mrs. T. Hastings. When it was first shown, some two years ago, its charming vivacity was recognised; but at the latest portrait exhibition in New York the sparkle of its colour seemed to have faded out, the flesh tints to be noticeably dark and inflexible, and rigidity to have crept even into the animation of the pose.

Such excess of spirit, however, is not symptomatic of Alexander's work. On the contrary, as I have said, it usually involves a very charming reticence, as may be seen in his *Woman in Gray*, which hangs in the Luxembourg. And Alexander shows a frequent partiality for large, balloon-like masses of skirt, which lend a certain discreet voluptuousness to many of his compositions. This sensuous suggestion, limited, it should be observed, entirely to the abstract æsthetic impression aroused by the composition, and not at all reflected in the sentiment of the subject, appears very charmingly in several small upright canvases. In the comparative reticence of these smaller pictures, it is quite possible that the artist is at his best.

If so, it may be because the decorative arrangement is not produced by a large expanse of drapery, but by the form and movement of the figure, and because the drawing in these cases is so interesting; the actual movement of the figure and the gestures of the head and hands are so full of feeling and of the charm of unexpectedness.

On the other hand, before a picture like *The Blue Bowl* one may be conscious of a certain exaggeration and barrenness of interest. When the sentiment is, if I may so describe it, an associated one, suggesting various ideas to various minds, carried further than an artistic motive and made the basis also of a subject picture, I doubt if Alexander is so successful. He is approaching that gentle

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"THE POT OF BASIL"

sentimentality which in his Munich days he probably contemned.

If my reasoning be correct, that Alexander's *forte* is the expression of sentiment through form and colour, rather than the elaboration of a subject, it may explain the fact that, notwithstanding his skill in the arrangement of a decorative composition, his mural decorations in the Congressional Library at Washington are disappointing. The six almost semicircular panels commemorate "The Evolution of the Book," and treat, respectively, *The Cairn*, *Oral Tradition*, *Egyptian Hieroglyphics*, *Picture Writing*, *The Manuscript*, and *The Printing Press*. They are in fact a series

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PORTRAIT OF GERALDINE RUSSELL

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of illustrations; as such, of considerable interest, but from a decorative standpoint surprisingly inadequate. The truth is, he had a very hard problem. In one panel he was called upon to represent a nude Egyptian, and in another three figures in the doublet and hose of the time of Gutenberg. This alone would account for the lack of sequence of feeling through the series, but it scarcely condones the unmural arrangement of the compositions.

If, then, the introduction of incident seems to impede the freedom of Alexander's invention and technique, how does he fare when he is called upon to depict the incident of character in portraiture? Here his deeper mental qualities of sympathy and insight come into play and mingle most harmoniously with the dignity and the refinement of his artistic impressions. It is not every artist nowadays who can make the portraits of ladies suggest that they have breeding and refinement as well as elegance. Indeed, at the recent Portrait Exhibition in New York it was most noticeable how little reverence for the sitter many pictures demonstrated. Whether we take, as example of Alexander's work, the portrait owned by the Carnegie Art Galleries, which is rather in the nature of a charming girl-study, or that portrait of his wife so "swell" in style and yet so exquisitely reverential in its tenderness, we find the artist seeking not to exploit himself, but to discover the personal charm of the sitter, and to infuse into the particular flavour of it his own susceptibility to beauty of expression. In the portrait of the artist's wife, the non-committal expression of the face, which prompts conjecture and leaves it guessing, and then the almost plaintive appeal of the pose, combined, as they both are, with a composition that is strikingly ample in feeling, seem to me to epitomise very satisfactorily that quality of Alexander's work which for want of a better term I have described as "discreet voluptuousness."

In his male portraits, such as those of Walt Whitman, of Rodin, and of Mr. James W. Alexander, the expression of character is much more pronounced. This is partly due, no doubt, to the fact that the respective characters are strongly marked upon the exteriors of these men; but partly also, we may suspect, to the fact that they are men, and therefore outside the bent of Alexander's usual study. On the one hand, therefore, he turns upon them a scrutiny that is the keener because the object of the study is comparatively novel; and on the other, since they do not wear skirts or otherwise lend themselves to his special kind of pictorial motive, he views them with an eye sole to what they are. Further, they are all men who mean much to him, and what they mean he has tried very zealously to put into their portraits, so that they must be reckoned among his most important works.

Courtesy Carnegie Institute, Pittsburg

PORTRAIT IN ROSE

Still, I believe, it is as the painter of an idealised expression of sentiment, conveyed through a girl's form, arranged in decorative pose, that Alexander is most characteristically himself. This is something which no other American artist accomplishes with the same mingling of ample handsomeness and delicate subtlety.

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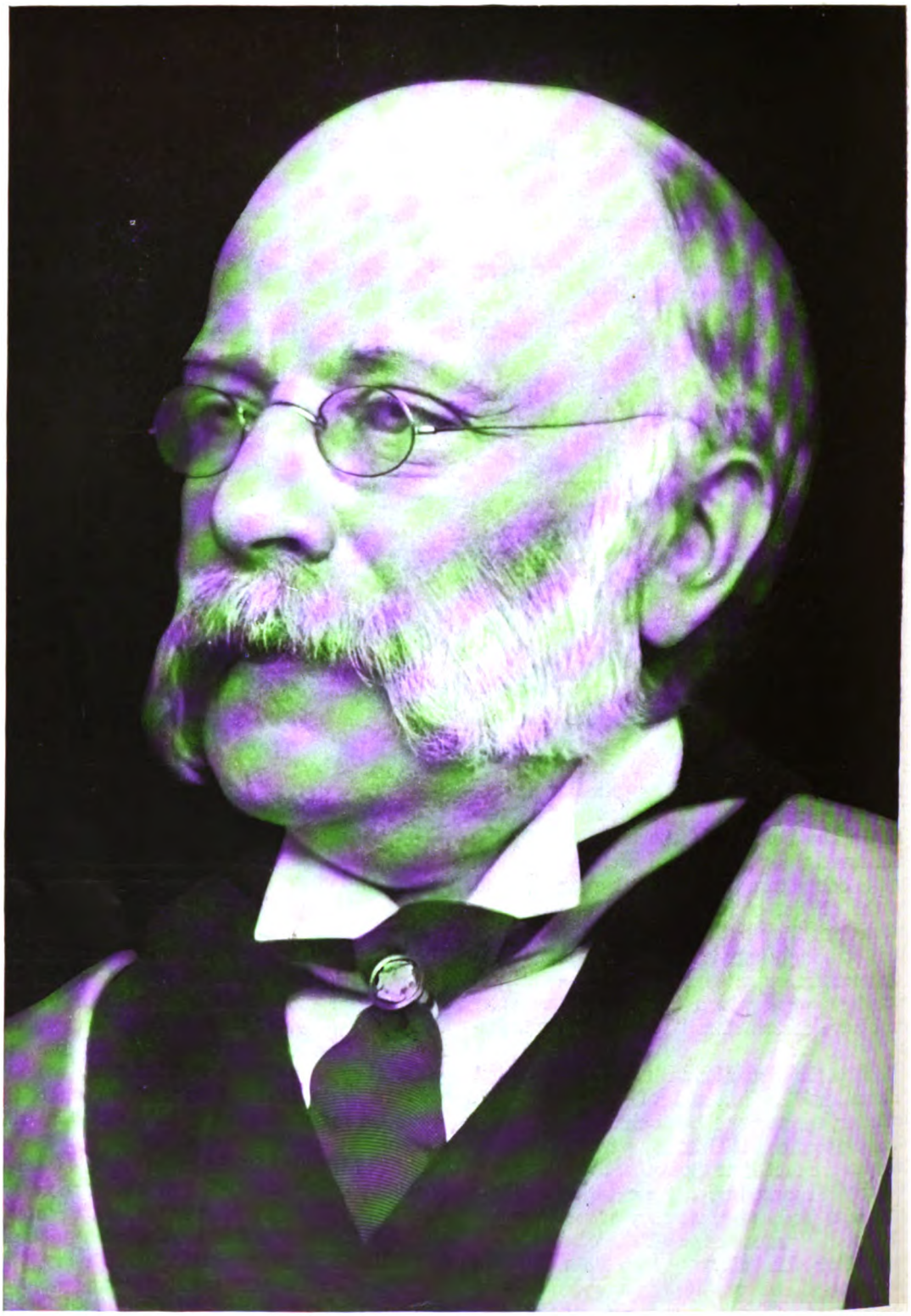

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SIR ARTHUR FÜCKER, LL.D., D.Sc., F.R.S.

PRINCIPAL OF THE UNIVERSITY OF LONDON

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LONDON'S GREAT TEACHING UNIVERSITY

AFTER FOUR YEARS—CHAOS HAS GIVEN PLACE TO ORDER IN THE HIGHER EDUCATION OF THE METROPOLIS—BOUNDLESS ACTIVITIES—AN IMMENSE SCHEME, AND AN AREA OF THIRTY MILES AROUND LONDON—THE NEW TREATMENT OF THEOLOGY—LONDON'S ACADEMIC SYSTEM EXPLAINED

THE Cambridge don to whom it came as a surprise that there should be people with ideas in London, might perhaps have been better able to defend his position five years ago, when a population of some seven million souls—many times larger than that which produced the philosophy and art, the science and literature of ancient Athens—was content to exist without a teaching university. Now, however, London's dark ages are past; the old reproach has been removed from her; and the complacent incredulity of the Cam is confronted with the equally absurd pretensions of the young Cockney B.A., who has been heard to dismiss Oxford and Cambridge under the category of "provincial universities."

Before 1900 London was content with a university whose whole duty consisted in the conduct of examinations and the granting of degrees. True, the old university discharged a useful function; but the desire to possess something more than a mechanically examining body, whose interest in a student began when he paid his fee and ceased when the examination list was published, resulted at last in the "University of London Act, 1898." This Act, while preserving the corporate continuity of the University, provided for a completely new teaching department, and under its terms the reconstituted university was in 1900 transferred from Burlington House to the palatial quarters which it now occupies at South Kensington in the Imperial Institute Buildings. This is the seat of government: here meet the Senate and its many advisory committees and sub-committees; here meet the seven Faculties, the twenty-nine Boards of Studies and numberless Boards of Examiners; here are held all kinds of examinations, written and practical; and here the Principal, Sir Arthur Rücker, assisted by a large staff of officers and clerks—none of whom is underworked—carries on the administrative work of the University. One catches a hint of the boundless activities of the new institution when one finds that on a busy day even this immense building is taxed to its utmost to provide accommodation for the various bodies summoned to dispose of University business.

Under the new constitution this business falls into three main departments. As we have already seen, the Act maintained the *status quo* of the old examining body; and consequently now, as formerly, there exists one class of students—gradually diminishing in number—who may still present themselves for examination quite regardless of how, when, and where they have picked up their education. This is the External side of the University, and in all matters concerning it the Senate—supreme in everything—is advised by a Council for External Students. A second department is under the care of the Board to Promote the Extension of University Teaching, which now adds the inspection of schools to the functions indicated by its title. There remains the third or Internal department—by far the most important outcome of the Act, inasmuch as it constitutes the new Teaching University. All Internal affairs are entrusted to the Academic Council, which advises the Senate in such questions as the assignment of funds for university buildings and apparatus, the appointment of professors and lecturers, the determination of the duties of appointed teachers, the regulation of courses of study and the conduct of Internal examinations. Every course of study, for instance, proposed by a candidate for an Honours degree must be submitted to the Council, and every course of lectures delivered by the 750 Recognised Teachers is carefully scrutinised before the Senate is recommended to grant its *imprimatur*. In a word, the function of the Academic Council is to co-ordinate and control the whole of the higher education of London.

The main features which distinguish London's

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academic system from all other academic systems are, in great measure, the result of the anomalous conditions with which the commissioners, appointed under the Act to draw up the new constitution, had to deal. It was no easy problem they were called upon to solve. Higher education in the Metropolis was a weltering chaos. Colleges and Polytechnics there were in abundance, scattered about the city and the suburbs; but each was entirely independent of the others. System and unity there were none. A further difficulty lay in the fact that in the different educational institutions the standard of the work carried on varied enormously. University and King's, for instance, might have taken creditable places beside their namesakes on the Isis and the Cam. Other institutions, again—which shall be nameless—were as bad as these were good; while the problem was still further complicated by the fact that in one and the same Polytechnic there might be found a Cambridge man doing a post-graduate course of research work and a young apprentice attending one evening a week at a class of plumbing or cabinet-making. Obviously distinctions had to be drawn, and by some means or other a criterion established by which teaching of a University standard should be differentiated from classes of a lower grade and allotted its proper place in the new academic scheme.

Before the Commissioners could decide, however, which institutions were to be recognised, either partially or *in toto*, for academic purposes, and which altogether ignored, they had to answer another question. What was to be the area of the new University? Here again the problem was without parallel. In Oxford or Cambridge your limits are pretty clearly defined by nature. You have your score or so of colleges, but they all cluster closely together within a few minutes' walk of one another. In Edinburgh and Glasgow, again, the University consists of one or two great buildings, and the area is still more strictly marked out. But the colleges of London, having sprung up at their own sweet will and without taking thought of any one's needs but their own, were scattered haphazard over a huge district. There are no fixed geographical limits to London, which is therefore susceptible of many interpretations. For the cabman "London" is defined by the four-mile radius; for the policeman by the less familiar fifteen-mile radius; while there are also a Parliamentary "London," a County Council "London," and so forth. The Commissioners, then, had to select an arbitrary definition, and they decided to define the London area, for the purposes of the new Teaching University, as the space within "a radius of thirty miles from the Central Office of the University."* Thus it is possible for two constituent schools of the University to be sixty miles apart, and while one internal student rejoices in the Surrey hills and the idyllic grounds of Holloway College, another pursues his academic career amid the unacademic surroundings of the Battersea Polytechnic.

Having settled the geographical area, the Commissioners had next to define the educational limits; and to do this they devised a kind of preferential tariff. Certain colleges, twenty-four in number † (*i.e.*, University, King's, Bedford, and Royal Holloway Colleges, the London School of Economics, the Central Technical College, the Royal College of Science, the South Eastern Agricultural College, Wye, six theological colleges and the Medical Schools of ten great London Hospitals, in addition to those of University and King's College Hospitals) were constituted "Schools" of the University in one or more of the faculties in which they provide instruction; and all persons attending lectures in these faculties are eligible for registration as Internal students.

First and foremost of the "Schools" comes University College, whose classes (except in the faculties of Medicine and Engineering) are open to men and women alike. Here complete courses of instruction are provided in Arts, Laws, Medicine, Science, Engineering, and Economics. Facilities for research are offered in all the departments, and excellent libraries have been graciously thrown open to every internal student, whether a member of the College or not. It is hoped that before long the College will be actually incorporated in the University, and towards this object a sum of £182,000 has already been contributed, of which the Drapers' Company have given £30,000 and Sir Donald Currie £40,000—a hopeful sign that the "pious founder" of the Middle Ages is not such an extinct species as some of us had imagined. The work of the various "Schools" could only be described in detail in a lengthy article, but in connection with the theological colleges at Hampstead,

* To this rule there is one exception: the South Eastern Agricultural College, Wye, a school of the University, is sixty miles from London.

† This number has since been increased to twenty-five by the addition of Westfield College, Hampstead.

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Regent's Park, Cheshunt, Richmond, and Highbury, it is worth while noticing the unique nature of the London Theological School. Here for the first time theology is treated as pure philosophy and pure science; no religious test of any kind is imposed on examiner or examinee, and, so far as the University is concerned, Jew, Turk, and Infidel are as free as Christians to take their B.D. and D.D. degrees.

Although attendance at a "School" doubtless gives a student the same sort of advantage as is enjoyed by a Balliol or Christchurch man over his non-collegiate brother, the "Tosher," such attendance is not compulsory for a would-be "Internal" student. It is left open to the authorities of any "public educational institution" within the appointed area, but not included in the list of "Schools," to apply to the Senate for the "recognition" of any of their teachers, and the lectures of teachers so recognised count as "approved courses" for Internal students. There are now thirty-three such "other institutions" to which recognised teachers are attached, among them being the Battersea, South-Western, and Woolwich Polytechnics; the Birkbeck, City of London, Finsbury and East London Technical Colleges; the London Day, Maria Grey and Mary Datchelor Training Colleges; the Royal College and Royal Academy of Music.

An Internal student is not permitted to enter for any Internal examination unless he has attended approved courses in all his subjects either at a School of the University or under recognised teachers at one or more of the thirty-three other institutions which have just been mentioned. Consequently his degree is a guarantee not only that he has passed certain examination tests but also that he has attended a systematic course of training which has received the *imprimatur* of the University. That undergraduates appreciate the prestige gained by the enjoyment of these privileges is proved by the fact that at the end of four years the Register of Internal Students shows a total of some 2500 names—a total which, to judge from the present rate of progression, bids fair to double itself at no distant date.

An interesting feature of this list is the large number of graduates of other "approved" Universities who receive a cordia welcome at London. Two courses are open to these: they may be excused the matriculation examination and proceed in the ordinary way to a Bachelor's degree, or they may, under certain conditions, be excused the examinations for the lower degree and proceed, after two years' approved study, to a Doctorate, or, in the case of Arts, to the M.A. and D.Lit. degrees. At present thirty-five graduates of other universities are reading as Internal students for higher degrees; and of these eleven are from Cambridge, four from Oxford, nine from other British universities, eight from the Colonies and India, and one each from Columbia, Berlin, and Heidelberg. For certain kinds of advanced work London offers magnificent opportunities. Where, for instance, could you find a happier environment for a post-graduate school of historical research? The British Museum and the Record Office—to mention no other places—have each their dark unfathomed caves inviting the industrious explorer. As Professor Pollard remarked at the opening of the autumn session at University College: "Of the extant materials for English History not one-tenth has yet been printed or calendared, and the whole of the English History, as it is written and read and known, is like an edifice built on foundations which do not occupy one-tenth of the possible area. Here is a void clamouring to be filled, herein lies the unique opportunity for a post-graduate school of historical research in London University."

London must always be entitled to honourable distinction among the universities as the pioneer of higher education for women. She first endeavoured to encourage the movement by offering certificates in subjects in which it was presumed that women would be most interested. The experiment, however, was not a success. Very few candidates presented themselves and those who did gained their chief distinctions not in these special subjects but in classics, mathematics, and science. The teachers urged that women did not desire fancy courses, but were anxious to be subject to the same tests and eligible for the same degrees as men. Accordingly in 1878 a supplementary charter was accepted from the Crown, and since that date all the University's degrees, honours, and prizes have been open to students of both sexes on perfectly equal terms. In 1904, 1106 women and 2025 men passed the matriculation examination, and these numbers may probably be taken as representing fairly well the proportion between the sexes throughout the University.

A student must indeed be difficult to please who cannot find a congenial course of study among the varied curricula which the University offers. He may take his B.D. and D.D. in Theology; his B.A., M.A., and D.Lit. in

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Arts; his LL.B. and LL.D. in Laws; his Mus. Bac. and Mus. Doc. in Music; his M.B., B.S., M.D. and M.S. in Medicine and Surgery; his B.Sc. and D.Sc. in pure Science, in Engineering, in Economics (including Commerce and Industry), in Agriculture, in Human Anatomy and Morphology and in Veterinary Science, and before long he will probably be able to take them also in Mining and Metallurgy. True, there are as yet no degrees in malting and brewing; but there is ample evidence to show that, while duly appreciating the value of classical and literary culture, London is as much alive to the necessities of to-day as the most up-to-date of her Midland sisters.

What then has been the effect of the reconstitution of the University on the higher education of London? After four years of strenuous work it begins to be possible to estimate this. Through the Boards of Studies the Teachers of the University have a voice in regulating the courses of study and schemes of examination, and they can thus directly exercise a wholesome control over the work of their students—a control that was absolutely lacking under the old system. Through the Academic Council the Senate is kept in close and constant touch with the Schools and Teachers; it knows their wants and is able, by virtue of this knowledge, to co-ordinate and systematise the higher education of the Metropolis. Already inter-collegiate courses of lectures on many important subjects have been arranged, and there are abundant signs that interest in University work has been quickened in all directions. The London County Council has allocated to the University a sum of £10,000 a year for the special encouragement of the study of German, Chemistry and Engineering. The princely gifts of Sir Donald Currie and the Drapers' Company have been already mentioned. The Goldsmiths' Company have presented to the University their Institute at New Cross, together with four and a half acres of land and some £30,000 wherewith to carry on the work during the next five years; and the University is also indebted to them for the famous Library of Economic Literature, collected by Professor Foxwell and valued at £10,000. A magnificent physiological laboratory has been established at South Kensington, largely at the expense of Sir Walter and Messrs. Alfred and George Palmer, where post-graduate work of a very high order is being carried on; and thanks to the generosity of Mr. Martin White, lectures on sociology are now being delivered, while a research fellowship in National Eugenics has been established by Mr. Francis Galton.* Directly opposite the University building a palace of science is being erected which will provide students with unrivalled facilities for experimental research; and a scheme has been set on foot for building an Institute of Preliminary and Intermediate Medical Studies, where the teaching of such subjects as biology, anatomy, and physiology shall be centralised instead of being scattered about, as at present, amongst the medical schools attached to the various hospitals. As we know, the War Office has recently shown signs of a praiseworthy ambition to add to the brain power of the army by offering commissions to graduates who will undergo instruction in military subjects; and only last January, as one result of this proposal, Mr. Arnold-Forster presided at the inauguration of a course of military lectures organised by the University of London. On every side we are confronted with the vigour and vitality of the new institution; and when we consider the unparalleled opportunities that it affords to almost every class of student, we can feel little doubt that London has at last acquired a teaching university in keeping with her wealth, her vastness and her resources.

* *See* THE WORLD'S WORK, December 1904. "Eugenics: The New Scientific Patriotism."

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THE MARCH OF EVENTS

NO DISSOLUTION IF THE GOVERNMENT CAN HELP IT—THE HORIZONTAL MR. CHAMBERLAIN—FISCAL UNREST TO CONTINUE INDEFINITELY—THE REMARKABLE QUARREL BETWEEN THE GOVERNMENT AND THE IRISH UNIONISTS—WHY WE OBJECT TO CHINESE LABOUR——THE STATE OF RUSSIA

BY

HENRY NORMAN, M.P.

THREE sittings of Parliament made one thing quite clear: the Government are determined to stay in office as long as they possibly can. No expression of opinion in or out of Parliament, no hostile by-elections, no consideration for the injury done to British trade by the indefinite prolongation of fiscal uncertainty moves them in the least. The watch-word has been given out—it is "Hold on tight!" Mr. Chamberlain was crying out for a dissolution not long ago. Now he acquiesces in the Prime Minister's attitude; he takes it in a horizontal position—"lying down," in fact. "So far as I am personally concerned, the sooner a dissolution comes, the better"; "Speaking for myself alone, as a private member, dissolution has no terrors for me whatever"; but "*if it comes in the ordinary constitutional way*, I say again, the sooner it comes the better." That is a very different note. The Opposition grounds for demanding it are "perfectly childish and fantastic." To appreciate the beauty of this new point of view, compare it with the remark of Mr. Parker Smith, M.P., who has stood for so long in a position of the greatest political intimacy with Mr. Chamberlain (he was the latter's Parliamentary private secretary) that he may fairly be regarded as echoing his chieftain's sentiments when he said no longer ago than January 11:

"The time has not yet elapsed for which the present Government was elected, but still the circumstances had altered so completely, and the questions that now divided men's minds were so different from those before them in the autumn of 1900, that he thought the time had come for an explicit expression of the nation's opinion on these issues. It was not satisfactory to pass Session after Session in evading the discussion of the questions which were most prominent in the minds of the members."

The fact remains, however, that the Government propose to hang on till they are forced off. Under these circumstances one would have supposed that they would set forth a serious programme of legislation. On the contrary, a very long and wordy King's Speech contains little besides an Alien Bill. The reference to redistribution is such as to make it clear they mean to do nothing—an indication which moves the staid *Spectator* to the angry comment that "nothing more grossly cynical"—than Lord Lansdowne's remark that the King's Speech presupposes "the possibility of his Majesty's Government passing a Redistribution Bill next year"—"has ever been recorded of even the present Government"!

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The debate on the Liberal fiscal amendment left the question precisely where it was. And where Mr. Balfour stands nobody has any more idea than before. He made a brilliantly clever speech, but a speech without a grain of information in it and wholly unserious in its handling of a matter of vital national concern. He only remains in office because his utterances on the fiscal question are so obscure that the two differing sections of the Unionist party can each claim that he is really on their side, yet he dismissed Lord Hugh Cecil's remark that it is the bounden duty of a statesman to make himself understood as "rather a hard doctrine." I ask any serious person to read Mr. Balfour's speech in the *Times* of February 17, and then say if a speech of chaff and persiflage like that is worthy of a Prime Minister, and if it does not exert a deleterious effect upon the spirit and influence of the House of Commons. Sir Edward Grey scored one of the best hits heard in Parliament for many a day:

"I will conclude by quoting, in regard to the situation, words used by the Prime Minister him-

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self with regard to a situation of ten years ago and somewhat analogous to this of to-day: 'I do not believe that in the whole of our Parliamentary history you will find a case in which the Government has deliberately come down to this House and said, "We have a revolution" (that is not too strong a word for a change in fiscal policy that has endured for sixty years) "in store for you to be embodied in terms not yet decided upon, to carry out a policy on which we are absolutely divided, which we mean to put off for one month, two months, three months, so long as it suits us." The House of Commons ought not to make itself a party to any such electioneering transaction as that.'"

And Mr. Asquith's words, in moving that "the various aspects of the fiscal question having now been fully discussed in the country for nearly two years, the time has now come for submitting the issue to the people without further delay," will surely appeal to every unprejudiced business man in the Kingdom:

"There is no man in this Honse, whether he believes in a fiscal change or whether he does not, there is no man in this House who does not know that the uncertainty and the unsettlement which now prevail are in the highest degree prejudicial to the best interests of the British Empire. The idea that this controversy can be allowed to go simmering on from general election to general election, both here and throughout the Empire, is an idea which I venture to submit to the House is preposterous in theory and unworkable in practice."

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The extremely dramatic and significant quarrel which has suddenly arisen between the Government and the Irish Unionists is still at high tension when these lines are written; nothing can yet be said of its ultimate effect. But it is so remarkable, and so full of possibilities, that all interested in politics must follow it closely. A brief summary of it, as far as it has developed, shows the following extraordinary state of affairs.

Last August the Irish Reform Association, a body of influential Irish Unionists, virtually the same as the Irish Land Conference which brought about the Irish Land Bill, with Lord Dunraven at their head, published a scheme of reform for the government of Ireland, containing—beside uncontroversial matter—two striking suggestions: one for a partly Elective Irish Financial Board, and the other for the establishment of a statutory body with certain delegated powers of legislation. This appeared in the *Times*, and shortly afterwards Mr. Wyndham flatly repudiated it on behalf of the Government. On the third day of this Session Mr. Wyndham, admitted that Sir A. MacDonnell, Irish Under-Secretary, had assisted Lord Dunraven in discussing and formulating these proposals, "which Sir Antony erroneously, but honestly, believed to be within Unionist principles." A debate in the Lords two days later threw a flood of light upon this curious admission. The *Times* accurately summarises the new information as follows:

"Last August it was thought that the psychological moment had come, and in two short days Lord Dunraven and his friends had transformed themselves into the Irish Reform Association, considered, amended, and adopted their first report. It is not clear what exact share Sir Antony had in these earlier proceedings. Lord Dunraven seems to resent the suggestion that the Under-Secretary was the originator of the scheme. But he gave valuable help on the details—it would be of interest to learn what help upon what details—and he gave 'information and advice.' The first report was rather vague, and people in Ireland wanted to know more about it. Again Lord Dunraven had recourse to the Under-Secretary, and again Sir Antony obliged him. He very kindly drew out the heads of the second scheme, went thoroughly into the matter with Lord Dunraven for two days, assisted him to draft the report, and finally had it typewritten for him in Dublin—perhaps in Dublin Castle."

All this was done with the knowledge and assent of Mr. Wyndham, though the latter explained in Parliament that he had not seen the two proposals in question until he read them in the *Times*. Then, as I have said, he repudiated the scheme. Now, to appreciate the true significance of this it is necessary to appreciate exactly who and what Sir Antony MacDonnell is. He was a brilliant Indian administrator, of nearly forty years' experience, who has declined, in order to come to Ireland and stay there, the great offices of Member of the Secretary of States Council and Governor of Bombay. Here is Lord Lansdowne's description of him and his work:

"He was at different times at the head of the Government of Burma, at the head of the Government of the Central Provinces, with a population of 12,000,000 committed to his charge, and he was Chief Commissioner of the North-West Provinces, with a population of no fewer than 47,000,000 under his government. Subsequently he became a member of the Viceroy's Council, and on his return home, as the noble marquis reminded us, he had the high honour of a place in the Privy Council conferred upon him. During that long and arduous service in India, Sir Antony MacDon-

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nell has had to deal with the most difficult of the many difficult problems with which Indian statesmen are confronted. . . . And may I say that during the five years which I spent in India, years during which I was constantly in contact with Sir Antony MacDonnell, and had ample opportunity of watching his work, I came to the conclusion that amongst the many able, distinguished, and upright men with whom I had to deal no one was more distinguished, more able, or more upright."

Moreover, it has always been well known that Sir Antony holds very "advanced" opinions about Ireland—in fact, he is generally alluded to as a Nationalist. Of course such a man would not accept the comparatively humble position of Irish Under-Secretary except upon terms. Before he did so he had interviews with the heads of the Government, and even with the King himself. His position is thus described by Lord Lansdowne:

"It follows as a matter of course that a man of that kind, a man of those antecedents, could scarcely be expected to be bound by the same narrow rules of routine which are applicable to an ordinary member of the Civil Service; and when he took up this appointment it was understood on both sides that he was to have greater freedom of action, greater opportunities of initiative, than he would have expected if he had been a candidate promoted in the ordinary course. And it was also understood between Sir Antony MacDonnell and the Chief Secretary that there were certain subjects to which their efforts were to be addressed, and which they had reasonable hope and expectation of being able to deal with should they remain in office."

Finally, Lord Dudley, Viceroy of Ireland, was also a party to Sir Antony's procedure, and authorised Lord Lansdowne to say that

"he was aware that Sir Antony MacDonnell was helping Lord Dunraven, and that he discussed the reforms suggested in the noble earl's scheme on several occasions with the Under-Secretary."

The fury of the Irish Unionists, outside the men who constitute or sympathise with the Irish Reform Association, may be sufficiently gathered from the concluding sentences of the *Times* editorial on the admissions in the House of Lords. After expressing "pain and amazement" at Lord Lansdowne's statement of Sir Antony's position, which "we do not hesitate to say is incompatible with the first principles of our administrative system," the *Times* declares that doubtless Sir Antony "will himself see that it is no longer consistent with his self-respect to remain in Dublin, but, should he fail to perceive it, it becomes the plain duty of the Government to relieve him of duties which he can no longer discharge to the public advantage." And it adds that "when a Unionist Lord Lieutenant and a Unionist Under-Secretary are discussing reforms which the Cabinet condemn as Home Rule in a thin disguise, it is obviously time that they quitted their posts."

What the Government will do remains to be seen. To dismiss Sir Antony MacDonnell, who has done, to the best of his ability, precisely what he was brought from India to do and given an exceptional position to enable him to do, would be an act of cowardice and treachery. But if they keep him, they may have a furious Unionist revolt to face. Those of us who believe in a large extension of Irish self-government as not only right in itself, but politically expedient, and in any case absolutely inevitable, can watch the development of the situation with complacency. As the *Westminster Gazette* points out, nothing is more striking than the list of Unionist Viceroys and secretaries who have come away from Ireland converted to a measure of Home Rule.

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The debate on Chinese Labour appeared to give the Government side of the House great satisfaction. Mr. Lyttelton lectured the Opposition in the style he has now permanently adopted, and the amendment was defeated by within two of the majority against the fiscal amendment. Yet those of us who agree with every British colony in regarding the importation of these indentured coolies as—in the language of a New Zealand newspaper—a "hideous outrage," remain of the same opinion. We are unaffected by the increase of dividends or of the capital value of the mines. We prefer that the gold should be got out slowly rather than fast. The Chinese may earn five times as much money as they do without our objection to them being in the least decreased. Our objections rest upon wholly different grounds and may be summarised as follows. The mine-owners have introduced Chinese simply to get big dividends, with the corresponding facility of unloading upon the public the enormous quantities of mining shares, at an inflated price, they now hold. They have introduced the coolie, on their own confession, to "pull up trade-unionism by the roots," and prevent a white proletariate "holding the country in the hollow of their hands"—precisely the system of government upon which the British Empire is based! They have introduced the coolie, with hand tools, because he is cheaper

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than white labour, for which machine tools would have to be provided. We regard it as proved beyond question that the mines, on a fair capital valuation, could be profitably worked by white labour—as in Australia, where almost all the conditions of mining are more difficult. We do not call the conditions of indenture "slavery," but we do regard them as a disgraceful step backward in civilisation. Why should this cheap serf-labour be restricted to the Transvaal? Why should it not be applied to every other enterprise in the Empire requiring large quantities of unskilled labour? To ask such a question is to answer it. I probably know the Chinaman at home and abroad at least as well as anybody in Parliament, and I say without hesitation, that it is absolutely impossible to introduce 50,000 celibate coolies into a white community under any conditions without risks so grave as to amount to a practical certainty of moral degradation of that community. Moreover, that there will be in the future as in the past, but worse, riots and murders, I am convinced. No sane man can doubt, too, that the employer will gradually let the clever Chinaman do skilled work as well as unskilled. It is certain, also, and is indeed already proved, that large numbers of these coolies are of the scum of China, and as such about the most unsavoury specimens of half-civilised mankind on earth. Finally, we point to the fact that every other white community on the globe keeps out the Chinaman. Mr. Lyttelton knows little about the Chinese, or he would never have entertained the ludicrous notion that the coolie would bring his "wife and family," and all his assumption of moral superiority leaves the question exactly where it was at the beginning. Where that is, the working-man of this country will show as soon as he has the chance.

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Interest in the war has been almost completely overshadowed by the impression produced in all countries by the domestic state of Russia. Without question there is a great deal of exaggeration in the news from Russia, and not a little wilful falsehood, though unsuspected by those who print it, but after every allowance for this the rest is dreadful enough to have deeply shocked the conscience of mankind. It is needless to recapitulate the dreadful story of the past month: the fact is that all the artisan population of Russia is in deep-seated rebellion against the system of government, and that nothing will satisfy it but two things: first, to permit the people, through elected representatives, on however restricted a franchise at first, to give voice to their needs and aspirations; and secondly, to abolish absolutely and for ever police tyranny, punishment without trial, and all the abuses connected with government by "administrative order." That these changes must come is certain beyond question. The Tsar, as I said last month, lost an infinitely precious opportunity of making them by his own grace. Made now, or made later after more revolt and more repression, they will lose more or less, as they are more or less deferred, of the high character with which he might have invested them. Iron-handed merciless repression may outwardly succeed again, as it has succeeded before. But the economic state of Russia produced by the war, no less than the intellectual upheaval resulting from the revelation of a state of corruption and incompetence greater than the most sceptical suspected, renders repression incomparably more difficult and less likely to succeed than ever in the history of Russia before. The first step in reform must be the summoning of the National Assembly. That would produce internal peace, to begin with. It will be found that the representatives of the zemstvos will act with moderation and with sagacity, and when they have freely discussed some of the great questions at the root of Russian life, and formulated their aspirations in definite proposals, these will be no wild-cat schemes but practical measures of imperative reform. There is positively no other way in which Russia can recover domestic peace, economic stability, or what is the foremost desire of every Russian—prestige. If reform along these lines be undertaken, and in no half-hearted or grudging way, the end of the war matters little. Without it, the very name of Russia will sink even lower in the esteem of mankind, and the Tsar himself will be judged and condemned according to the acts of his subordinates, and not by the aspirations, however lofty these may be, he may privately cherish. The path of safety, of honour, and of prosperity is really very easy; the path of repression will be hard and bloody, every step on it will be followed by the objurgations of mankind, and it can in the end, however tortuous, lead only to the same goal. For the moment all hinges on this question: will the Tsar convoke that old Russian institution, the National Assembly, and allow it free expression of opinion? My own opinion is that he will.

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CAN THE TOWNSMAN FARM?

I. AN ACCOUNT OF THE TRAINING GIVEN AT AN AGRICULTURAL COLLEGE

AGRICULTURE HAS NOT GONE TO THE DOGS—THE NEW INTEREST IN FARMING—EDUCATED TOWNSMEN'S ASPIRATIONS TOWARDS THE LAND—HOW TO CHOOSE AMONG AGRICULTURAL COLLEGES—CHARGES AND COURSES OF STUDY—A VISIT TO A TYPICAL COLLEGE—WHAT THE TRAINING REALLY AMOUNTS TO

BY

"HOME COUNTIES"

With photographs taken on the College Farms

"All classes of farmers should be taught to recognise that agriculture, to reach its highest and most remunerative development, must be reared on the solid foundation of scientific principles, and not on the empirical knowledge, however valuable, of the less difficult times of our forefathers."—THE PRINCIPAL OF THE ROYAL AGRICULTURAL COLLEGE.

TWO views are held as to the prospects of British farming. One is that they never looked worse. The other is that they never looked better! That our agriculture is "gone" is widely believed. Are not foreign corn, foreign beef and mutton, foreign feeding-stuffs for cattle all cheaper than home-grown? On the other hand, there are spirited folk who are most hopeful about British farming.

I was recently much impressed by the views of the Director of the Rothamsted Experimental Station. Here is a man, an Oxford man, who has been head of an Agricultural College, and is now in control of an establishment identified with the most advanced agricultural science. If any man is and has been brought face to face with the shortcomings of the British farmer, and with the results of educational work in farming abroad, it is surely he. If any man—he is trying, apparently in vain, to get the Board of Agriculture to give him a grant of £500 a year to extend the work of Rothamsted in useful directions—should be downcast, it ought to be Mr. Hall. But I found him hopeful rather than hopeless.

As a class, he declared, our farmers are the equals, if not the superiors, of the farmers of any other nation. Do not British agriculturists he asked, obtain an average production of corn per acre higher than that reported from any country which issues Agricultural Returns? *

While foreign competition has been increasing, while the expenses of running farms in Great Britain have been mounting up, while labour has become scarcer, while the proportion of land owned by those who work it is still small, is it not the fact (the optimists run on) that the number of farmers who go bankrupt is surprisingly low, that the standard of living in farmhouses has risen considerably, and is still rising, that when farms worth anything at all become vacant tenants are always forthcoming—either farmers' sons, in other words men from the very class which professes itself "ruined," or shrewd business men in the towns?

Again, was there ever a time when more agricultural text-books were written, more agricultural journals published, more agricultural conferences held, and more agricultural lectures delivered? Were there ever more Agricultural Colleges in existence? Were larger sums ever spent by the State in the promotion of farmers' interests? † Were artificial manures ever cheaper on the whole, or more varied? Was agricultural machinery ever so effective and so inexpensive? Were railway rates ever lower? Were the facilities for marketing produce ever greater, or the prospects of practical agricultural co-operation ever more promising?

* For reply to this, see Prince Kropotkin's "Fields, Factories and Workshops."

† Agriculture alone among our industries has a Government Department of its own, and a representative in the Cabinet.

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A few years ago it was generally accepted as a fact that railway charges were a crushing load on the farmer's back. It is now realised that there has been not a little exaggerated talk on this matter, and that the railway companies were never more disposed than they are at present to deal equitably with agricultural customers who are prepared to meet them in a businesslike way.

In a sentence, those who believe that the prospects of farming in this country are excellent have not a little to say for themselves.

The fact that agricultural questions receive so much attention in the public Press is surely significant. In a recent issue of a political review I noticed no fewer than three articles on rural topics. There is, undoubtedly, an increasing disposition on the part of townspeople and of folk who do not make their living out of farming to hear and to read about agricultural problems and to lend a hand in solving them. Certainly, if agricultural experts have any plea to address to the nation they have not now to stand cap in hand. We are all, in fact, more or less "Back-to-the-Landers" now.

The result of all this increased attention given to country matters, is that there is a new interest in the educational equipment of the farmer and the question of how farms can be made to pay. I know three men in London, whom farmers, if they knew them, would consider to be the unlikeliest folk to want farms, who have bought large agricultural holdings and are keen on making them answer financially.

Inspired by something of the same sentiments, landowners, men in the services, and merchants are asking themselves whether it might not be a good thing to put a son into farming, and if so what is the best way of getting him the right training.

Farmers, in their turn, are inquiring whether a course at an Agricultural College would not instruct their lads in something which they themselves are unable to teach them.

Then, a certain number of middle-aged townsmen, recognising the fact that the conditions of farming have changed and are changing, that up-to-date and businesslike methods must be adopted, and that capital is requisite, are wondering whether there might not be openings for themselves in farming if they took into it their business training, vigorous methods, and financial resources.

In the following notes I propose to give some notion of the kind of places the Agricultural Colleges are, to describe the sort of training they give, and to explain what is, in the opinion of experts, the equipment which a man needs if he is to make a farm pay.

I. Agricultural Colleges, their Charges and Courses

As I cannot find in any work of reference a complete list of the Agricultural Colleges, it may be convenient if I begin by giving the list (to which I shall refer later on) of "institutions aided" last year by the Board of Agriculture:

§ University College of North Wales, Bangor.
§ Leeds University.
§ Durham College of Science, now Armstrong College, Newcastle-on-Tyne.
* § Cambridge University.
* § South-Eastern Agricultural College, Wye.
§ University College of Wales, Aberystwyth.
§ University College, Reading.
§ Midland Agricultural and Dairy Institute, Kingston, Derby.
* § Harper-Adams Agricultural College, Newport, Salop.
* § Agricultural and Horticultural College, Holmes Chapel, Cheshire.
* § Agricultural and Horticultural College, Uckfield, Sussex.
§ Harris Institute, Preston.
British Dairy Institute, Reading.
Eastern Counties Dairy Institute, Ipswich.
§ Cumberland and Westmorland Farm School.
§ West of Scotland Agricultural College.

In the above list there are these omissions:

* § Royal Agricultural College, Cirencester.
* § College of Agriculture and Estate Management, Downton, nr. Salisbury.
Edinburgh and East of Scotland College of Agriculture.
* § Agricultural College, Aspatria, Cumberland.
* § Tamworth Agricultural College and Training Farm, Alvecote Priory, Tamworth.

In the two lists I mark all the Colleges which are residential thus (*), and all those which possess or have the use of farms thus (§). Many of the Colleges have their farms at their back-doors—Wye is a case in point—but the only institutions which actually stand on a farm, as a farmhouse stands on a farm, are, I fancy, Downton, Harper-Adams, and Tamworth. For example, Reading College has just bought 150 acres near the town. Uckfield's hundred acres is three-quarters of a mile from the College. Aspatria, though it

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stands in a purely agricultural district, finds it answers best to make arrangements with eight adjoining farms to provide the students with practical demonstrations of farmwork. Cirencester has a farm at hand, but a famous ex-student who has won £4500 worth of cattle prizes farms it. These details can be readily found, however, in the prospectuses.

Cirencester, Downton, Aspatria, and Tamworth are all proprietary Colleges. Colleges like Wye are largely maintained by County Council grants. Newport has the advantage of a generous endowment, and is therefore a particularly cheap College. The most expensive of all are Downton (£150 a year for in-students, £75 for out-students, both sums inclusive) and Cirencester (£135, in-students, £75, out-students). (Owing to extras, Downton is not the dearer.) Wye is £100 for in-students and £40 for out-students; but, as in the case of all colleges which receive County Council grants, local students are received at a low rate—sons of residents in Kent or Surrey, £60; local farmers' sons of promise, £40; out-students resident in Wye, £8; outside Wye, £15. I need not give the corresponding reductions in the case of other Colleges but I see the fees for non-county in-students at Aspatria, Tamworth, Uckfield, and Newport are respectively: £95, £66 (there are special reductions for age at Tamworth), £60, and £43.

Associated with Reading College, and managed by a joint board consisting of members of the College Council and the British Dairy Farmers' Association, is the British Dairy Institute, which is recognised as one of the chief institutions where a complete and thorough training can be obtained in dairy work. The Theale poultry farm of which Reading students have the advantage is also well known.

At some of the Colleges there is an entrance examination, but I imagine that it is regarded chiefly as a convenient means of keeping out undesirable students. As to age, the minimums of the different institutions vary. Uckfield is, however, the only College which has a maximum. It objects to married men. As to manual work, the following extracts from the prospectuses of the Colleges give some notion of the way it is viewed by those in authority:

DOWNTON.—"Expected to take part; office of assistant, shepherd, pigman, dairyman, &c.," by arrangement.

CIRENCESTER.—"Optional, but facilities and encouragements given."

WYE.—"Not compulsory, but every facility given. Carpentry and iron-work are compulsory."

ASPATRIA.—"Progress depends on the desire students show to do any useful work, some portion of each day being spent upon the farm."

UCKFIELD.—"Two hours a week to carpentry, and help in feeding, killing and dressing cattle, compulsory."

READING.—"Not compulsory, but students are specially encouraged to assist in the work of the farm."

NEWPORT.—"Practical agriculture compulsory, unless exemption is obtained."

TAMWORTH.—"All students engage daily in practical work, health and weather permitting."

The sessions are very much the same at all the Colleges—three (spring, summer, and winter), of about twelve weeks. No courses are shorter than two years, and though college diplomas can be got at the end of this period, three years is generally considered to be none too short a time to study. More valuable diplomas, indeed distinctions awarded by national authorities, are attainable by three years' men.

With regard to the subjects taught, they usually extend from theoretical and practical agriculture in all its branches, and with all its incidental 'ologies and 'ics, to estate management and land agency, forestry, building construction, surveying, book-keeping, and elementary engineering to fruit-growing, poultry-keeping, veterinary medicine and surgery, horse-shoeing and general blacksmithing, saddlery and carpentry.

Some Colleges naturally devote themselves more to certain branches than others—Wye, for example, being in Kent, does not forget the importance of fruit, hops, and poultry; Uckfield gives special attention to poultry fattening—and would-be students, or those responsible for the choice of a College, should bear this in mind in making a selection. Other things being equal, there is also a great deal to be said for choosing a College in the district in which the student resides or in which his farm is likely to be situated. By so choosing he will get his training more cheaply and he will obtain the benefit of local knowledge.

Many English students go to the two Scottish Agricultural Colleges, the West of Scotland, at Glasgow (under Professor Patrick Wright), the East of Scotland, at Edinburgh (under Professor Wallace). A third, the North of Scotland, has lately been started at Aberdeen. The West of Scotland's dairy school and experimental station are at Kilmarnock. The East of

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Scotland supplements the work of the Agricultural Department in Edinburgh University, the Agricultural chair at which was founded in 1790.

It has been suggested that the "Agricultural Colleges are most suitable for the young townsman, the University Colleges for the farmers' son, and the Universities for training teachers and experts."

II. Duration of the Students' Stay

One of the difficulties with which Agricultural Colleges have to contend is that so many of the students come to them with so poor a knowledge of science that a considerable amount of valuable time is lost in teaching them elements with which they should have been already familiar. There is also, as Mr. John Percival, M.A., Director of the Agricultural Department at University College, Reading, and late Vice-Principal of Wye College, says, another aspect of the scientific instruction which demands attention, and that is the maintenance of the proper balance between this part of the student's training and the teaching of subjects more immediately concerned with farm practice and management.

"While I recognise to the full [says Mr. Percival] the value of a thorough training in the principles of chemistry, botany, zoology and similar sciences, I am very much inclined to think that there is a great tendency for the scientific work to be too elaborate and too extensive in its scope for the needs of the farmer, and some of the time devoted to it could be better spent in dealing with the agricultural side.

"The chemist frequently insists upon running his hobby as far as he can for all classes of students, demanding several hours a week for training in the analysis of fertilisers and food-stuffs. The botanist does the same, running riot among fungi, bacteria, and special vegetable pathology. The zoologist and geologist also follow suit in their own particular subjects, with the result that if all these demands are allowed, the student is gradually transformed into an imperfectly trained expert rather than a farmer who has to live upon the land."

Mr. Percival goes on to express the opinion that some of the "various official examinations" appear to be "more suited to the needs of teachers and experts than *bonâ fide* farmers, being overloaded with science and subjects such as engineering and surveying." At present, he declares, and he is not the only authority who holds the same views about certain national diplomas, "we have no official examination quite suited to test usefully the competence of the farmer."

This expert thinks that

"the time which an ordinary agricultural student should spend at a College depends upon largely the school training he has received. But, assuming that his previous education has not been defective, two years is all that is necessary when the curriculum is arranged and organised on the lines suggested.

"The question of how these two years are to be allotted is a matter upon which difference of opinion exists. Some prefer the student to take three or four consecutive short winter courses, allowing him to return to assist on the farm during the busy time of the year. For my own part, I think it is very much better that no break of this kind should occur in the students' training beyond the ordinary College vacations, which should be spent on a farm.

"It is difficult to maintain that continuity of interest which is essential for an efficient grasp of a subject when the course is broken up and spread over three or four years, and practically impossible for the student to take up satisfactorily each winter the thread of his work where he left off in the previous one."

"The ideal course," the Director of Reading thinks, is "two years or two complete sessions at an Agricultural College, followed by one or two years with some competent, up-to-date farmer of wide experience and interests."

III. What the Students Learn

I find that at Wye the subjects on which courses of lectures are given during the first year are as follows:

"Agriculture; botany; drawing and building construction; zoology, &c.; surveying; veterinary anatomy and physiology; chemistry; geology; application of chemistry to agriculture; physics."

In the second year the lectures are on these subjects:

"Agriculture; estate managment; engineering; law; surveying and levelling; forestry; drawing and building construction; poultry-keeping; book-keeping; hardy-fruit growing; hop growing; agricultural chemistry; woodwork; agricultural botany; ironwork; economic entomology; farriery; veterinary medicine and surgery."

To obtain the College diploma a student must have—

"Resided at least six terms; passed Part I. of Diploma; passed Part II. of Diploma at one attempt; sent in a set of practical work and be certified as having attended the practical classes regularly, and as having satisfactorily performed the manual operations."

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The practical work referred to is according to the following schedule :

"(1) A diary of the farm operations for one year, signed each term by the Principal or Vice-Principal. This must also include a balance-sheet and a set of books showing the year's working, with a valuation at the beginning and end of each year. The year may run from Michaelmas to Michaelmas, or from Lady Day to Lady Day.

"(2) Either of the following :

"(*a*) A plan from actual survey (drawn to the scale of 66 ft. to an inch) of about twenty acres of land, containing at least three enclosures. The survey lines and observed angles to be shown on the plan ; also a section of levels through the survey, plotted to a vertical scale of 10 ft. to an inch.

"(*b*) A detailed, closed traverse of a piece of land of similar size to that in (*a*) and plotted to the same scale ; also a section of levels as above.

"The field and level books to be sent in with the plans and sections.

"(3) A laboratory note-book signed by the Lecturer in Chemistry, showing the practical work performed throughout the whole course.

"(4) A herbarium containing dried specimens of grasses and of useful and harmful agricultural plants.

"(5) A laboratory note-book, signed by the Lecturer in Botany, showing the work done by the student throughout the whole course.

"(6) A series of micro-slides to show the common constituents of oil-cakes and their impurities.

"(7) A series of slides of parasitic fungi injurious to farm crops.

"(8) A mounted collection of insect pests, parasitic organisms, &c.

"(9) A certificate showing the following have been performed satisfactorily :

"(*a*) Grafting and budding of a series of fruit-trees.

"(*b*) Harnessing a horse to a waggon.

"(*c*) Mowing a strip of grass or lucerne.

"(*d*) Milking.

"(*e*) Butter- and soft cheese-making.

"(*f*) Regular attendance of the practical classes in wood- and iron-work, and in the dairy, poultry-yard, and orchards."

All students residing in the College must take the full diploma course, and no student is admitted who wishes to depart from this course, unless he requires practical farm instruction only, in which case he has to live at the farm and attend the agriculture, veterinary, and book-keeping lectures at the College and the workshops.

Here are some specimen questions which were asked in recent examinations at Downton College :

"What would be about the cost of horse-labour per annum to work 400 acres of (1) light ; (2) medium, and (3) stiff tillage ground ?

"Arrange a set of men and horses for (1) dung-carting ; (2) wheat-carting.

"Why should barns extend from north to south ?

"State number and place of each man per day for threshing, and state cost, including coal, oil, and wear and tear.

"In what respects is a root crop inferior to the preparation of land by bare fallow from a chemical point of view ?

"Do sidebones always cause lameness ? Can they be removed ?

"What obligations to repair (in the absence of express contract) rest on a tenant from year to year, and a tenant for a term."

The following questions in practical agriculture were set before students at Cirencester :

"On a farm of 500 acres, 200 in pasture and the remainder arable, the pasture consists of 50 acres meadow mown for hay, and 150 average ordinary grass of fair quality. The arable varies from light to strong, but is all suitable for sheep. The agreed rent, including tithes, is 28*s*. per acre, and the average rates about 4*s*. Assuming a Michaelmas entry on the farm, give the approximation totals of

"(1) The valuation on entry, all hay and straw of the previous year being taken by incomer at consuming value, cakes and approved artificial foods being paid for at one-third the cost for last year and one-sixth for the previous year, and roots and fallows at cost of seed, manure, and working.

"(2) The number of horses required, and their cost.

"(3) The number and description of breeding-ewes and other sheep, and their estimated cost.

"(4) The waggons, carts, and other implements of all kinds, and their estimated cost.

"Having made these calculations, give (*a*) the heads of other necessary expenditure during the year ; (*b*) the probable receipts during the same period, and (*c*) from these data show the capital necessary for taking the farm and successfully carrying on its business, allowing a reasonable reserve for contingencies.

"In case you assume bullocks fed, give full particulars of their management.

"Finally, make a balance-sheet showing total receipts and expenditure in an ordinary year."

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IV. A Visit to an Agricultural College

I had lately the opportunity of spending an afternoon and evening at Wye College, some photographs taken at which accompany this article. As the institution is maintained by the grants of the Kent and Surrey County Councils and the Board of Agriculture, it is in a position of some independence and its circumstances may be considered easy. The present number of pupils is eighty-nine. Because applicants are being continually refused admission, the rambling old building is about to be extended.

On the two hundred and eighty acres of the farm—very shortly to be increased to five hundred—a great variety of work was in progress or planned. There was also instructive variety among the stock; I noticed half a dozen breeds of cattle, sheep, and pigs. The housing of the animals, the arrangement of the farm-buildings, the state of the land, and the general look of things reflected credit on the Principal (Mr. M. J. R. Dunstan, M.A.) and the hard-headed Scots bailiff.

Mr. Dunstan (of Merton College, Oxford) is probably about forty, and suggests the rural landowner of the better type, that is, the man who has acquitted himself creditably at his university, keeps himself fit, takes a real interest in rural problems, and finds country life intellectually satisfying. As he does not allow his students to keep a horse, he does not ride one himself. I should think he is a disciplinarian; I should also imagine that he is respected and liked by his students, and that his influence is generally wholesome.

In hall at dinner I noticed that though four or five of the students had beer, no beer or wine was drunk at the high table. I suppose that the restrictions on the men are as few as possible. The Principal tells new arrivals, I have heard, that they are expected to behave as gentlemen, and that if they do not, or if they get drunk, or speak to a village girl, they will be summarily got rid of. I saw some of the students going into a neighbouring "hotel" but there is no regulation, as at some agricultural colleges, against entering public-houses, except after dark. The gas goes out at eleven, but if the students—each has a study-bedroom—like to light candles no one says them nay. As a matter of fact, many of them do work by candlelight. As a consequence, the majority at least of the students do not seem to be early risers. This strikes one as a little curious in an Agricultural College, where early rising, one would think, should certainly be inculcated; but, no doubt, the members of the staff find it inexpedient to attempt to regulate the students' way of life too closely.

Most of the young men I saw were of much the same type as the average Oxford undergraduate, and the rules of the College, its arrangements, and general tone suggested what is to be met with at a public school.

Cirencester has the reputation attaching to the "Royal" College. The most economical are probably those in the North. It is difficult to fix the position of Wye. The fathers of a large number of the students seem to be officers in the army and navy. Many of the men came from rural rectories. Some are landowners' and farmers' sons—the fathers of perhaps 40 per cent. are farming in some way or other. A certain proportion of foreigners—seemingly from South Africa and the Continent—are admitted to the College. The lads of widely different training seem to get along together not so much by "mixing" as by forming "sets." The men of different ranks in life are brought to recognise each other's merits sometimes by games, sometimes by examinations, and sometimes by farm work.

On the wet afternoon on which I visited the stock-yards—at some distance from the College—I came across three men improving the time. One, note-book in one hand and pencil in the other, was privately cross-examining the bailiff. The Principal told me that all of them were first-rate fellows. One student I afterwards met said he got up by six every day. He had already planned his future, and knew exactly what stock and crops he was going to have on the home-farm when he was through his course. Another student I questioned had his future programme on his father's acres similarly cut and dried.

As to the proportion of slack students, I had, of course, no opportunity of forming an opinion, but, no doubt, drones exist. If men are disinclined to work, and have no plans for their future, are not keen enough to map out careers for themselves, they can waste their time as easily at Wye as at Oxford—but only, observed the Principal when I said so, until they are found out! At one Agricultural College, the name of which I cannot, of course, mention, many men are undoubtedly idling.

V. Choosing a College

Any one thinking of sending a son to an Agricultural College cannot make too careful inquiries as to the tone of the place—whether

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the most influential men are the workers—and as to the degree to which an example of simple living, industry, and intelligent interest in rural problems is set by the staff. If for no other reason than that the spirit manifested in the various Colleges varies from year to year, I can hardly single out any particular institutions for special commendation. The matters I speak of should be a subject for inquiry, each interested reader for himself.

Another point worth investigating is as to the authority of the Principal and his staff as exponents of Agricultural Science. It is difficult for me to mention names deservedly held in high repute when mentioning some means leaving others unmentioned. Happily, the incompetent have now been almost entirely weeded out, and when ordinary precautions are taken in choosing a College, a young man who means to work is hardly likely to experience much difficulty in getting full value for the time and money spent on his courses.

In default of other means of forming a judgment as to the advantages offered by the rival Colleges, beyond those apparent from their prospectuses, copies of the annual reports of the Board of Agriculture's inspectors for the last three years on the distribution of grants for Agricultural Education and Research, with statements respecting the several Colleges and institutions aided and the experiments conducted, might be purchased. They are issued by Eyre and Spottiswoode at ninepence or so each, and can be ordered through any newsagent. In these reports are tables showing the Colleges to which the Government gives grants. As Lord Onslow once said to me, the public may have confidence in the Colleges subsidised by Whitehall. I may mention, by way of illustration, that in the last issued report Wye is down for a grant of a thousand pounds odd.

When I consulted Mr. P. Hedworth Foulkes, B.Sc., of the Harper-Adams Agricultural College, Newport, Salop, on the choice of a College, he drew attention to " the marked division between the University College with an Agricultural side (in some cases without a farm), and the purely Agricultural Colleges, which, in most cases, are residential."

" In the former case [he said] the teaching is almost purely theoretical, because the farm (if the College possesses one) is, necessarily, some distance from the College and involves a journey by train, in one or two instances of nearly an hour's duration. Such farms, consequently, are used for experimental purposes and occasional visits are paid by the students. In the purely Agricultural Colleges, the farms are used to a greater extent for practical work and the students take a more active interest in the work.

" A friend once said to me, in comparing a University College with a Residential College, that a difference was noticed between the two in students ' talking farming ' at meals in the one case, whereas in the other as soon as the class-room door was closed all mention of Agricultural topics ceased.

" Unfortunately, all the Agricultural Colleges do not have their farms immediately adjoining the College, and therefore much time is lost by students in passing from the field to the class-room. I think I am right in saying that the only two Colleges which are situated on the farms are the Downton and this College. In the case of both Cirencester and Aspatria, the farm does not belong to the College, though it may be close to the premises.

" A rather important point, too, I think, is that while all University Colleges are public institutions, only three of the Residential Colleges, Wye, Uckfield, and this College, are under public management, this College being the only one which possesses an endowment."

Mr. Foulkes then spoke of the different classes the Colleges receive :

" From my twelve years' experience of Agricultural teaching, I have come to the conclusion that Agricultural students may be divided into two classes, irrespective of social status. The first class includes those who have had a good secondary education and are capable of undergoing a good training in applied sciences, whether with a view to taking up land agency, farming, or teaching, and I have seen such young fellows from various grades of society prove successful. A farmer's son with a good secondary education always has a better chance of success, owing to his natural knowledge. In the second class of Agricultural students I would place a very large number of students who are sent to Agricultural Colleges, because they lack a natural aptitude for commercial life, or because a parent considers it a more healthy life, or because he has failed in some other branch. How often one sees army or navy failures put to farming ! "

The practical training of students is a subject which Mr. Foulkes said he had most carefully considered :

" As I have had seven years of University College work and four years of Residential College work, I think I am entitled to form an opinion on the subject. With the first class of students that I have mentioned, practical work I consider necessary, along with the theoretical training, as a means of keeping students in touch with

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practice. The tendency is to make a scientist of the student and to spoil him for a practical career. It is only too true that the harm done during the early days of technical instruction in Agriculture was done by men who had only a scientific knowledge.

"I have put my ideas into practice here by having two distinct courses of instruction: (*a*) Diploma Course, for advanced students, when a certain amount of practical work is done each week, so as to encourage an interest in what is going on on the farm, and this practical work is compulsory. Students in this course work for the higher Agricultural Examinations like the National Diploma and the Surveyor's Institute. (*b*) A Certificate Course of a more elementary character, with much less science and a good deal of practical work, so that a student not only has to take an interest in the farm-work but he is, at the same time, learning how to perform practical operations which he will himself undertake should he farm at home or go abroad. In this way, all students who take our Diploma or Certificate must be able to plough, handle a team, make butter and cheese, &c."

One of the things which struck me at Lady Warwick's Lighter-Branches-of-Agriculture-for-Women College at Studley Castle * was the vague way in which some girls were sent there by their parents and guardians. When such students began work they did not know what they were aiming at, they never found out during the various sessions through which they aimlessly studied, and when their course came to an end they begged the Warden to be so good as to tell them where and how they could get "a post" of some kind.

At Wye I found that many parents were sending their sons to the Agricultural Colleges in the same happy-go-lucky fashion. To cope in some degree with this unwise course of procedure Mr. Dunstan addresses the following appeal to people, before sending him their sons, to make up their minds what it is exactly that they want the Agricultural College education for. As he says, for men to arrive at College without any fixed point to work to means simply marking time.

"The attractions of an open-air life," says Mr. Dunstan, "undoubtedly lead many parents, in some instances unacquainted and unconnected with landed interests, to give way to the suggestion that a youth who has shown little partiality for books, and, it must be admitted in some cases, little partiality for serious work, should go in for something connected with farming. Estate agency or cattle ranching are airily mentioned, as if these were pursuits that made few demands on the qualities of sound knowledge and business acumen of a man. To many young men both these occupations suggest a free-and-easy life; in the saddle, perhaps, most of the day, and a variety of attractive pursuits in addition."

* The World's Work, February 1904, "The Girl Gardener: Is she really going to be a success?"

VI. Openings in Estate Agency

What are the facts? Take estate agency first. "The estate agent of to-day, when landlords have to practise every economy in the administration of their own property, and at the same time to give their tenants every opportunity to meet the depression of the times with improved buildings and reduced rents, must be a many-sided man to fill the duties of his responsible position with satisfaction and profit to his squire, the tenants, and himself. He must be a man of firm and courteous demeanour, able to say 'No' with perhaps the desire to say 'Yes'; of first-rate business capacity, a good judge of men and of stock, well experienced in the practical conduct of a farm in both modern and ancient methods, with some knowledge of surveyor's, architect's, and builder's work, and a competent knowledge of the law of landlord and tenant, and of the management of woods and forests."

How is the knowledge to be gained? "A course of two or three years at a College is not sufficient, but is almost essential, for by this means he can get, in a comparatively short time, the concentrated records of teaching and experience in the different departments of the work, which will enable him to make a greater use of the further part of his training. After such a course at the College he should have obtained his diploma with honours in his special subjects, and the Professional Associateship of the Surveyors' Institute. The next step is to serve an apprenticeship with a good agent who takes interest in his pupils' welfare and instruction, not one who accepts the premium and relegates the pupil to clerks' work all his time, and not the head of a large office, where the regular work is done entirely by clerks, and the pupil has no opportunity of doing responsible work, but merely of seeing it done. An agent of an estate should be chosen, if possible, where there are some farms in hand."

But as to the openings. "In these days of depression for landlords and tenants," Mr. Dunstan confesses, "agencies are not the positions they used to be, and the supply of more or less qualified men is far greater than some years back. Without influence or a

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connection of some kind with landed proprietors it is a poor lookout for a young fellow, however well equipped, to obtain a living out of estate management, and it must be stated frankly that the prospects of employment in this profession are extremely remote, unless some definite influential connection with a landed interest can be secured beforehand. Estate agency work is therefore out of the question for the great majority of agricultural students."

VII. The College Student as Farmer

Now for farming at home. This is Mr. Dunstan's wisdom: "For a clever, shrewd, resourceful man, with a special knowledge of and aptitude for one of the branches of stock-breeding, hops or fruit, or other special crop-growing, there is a future. Capital is, of course, required for this, and a reserve of capital to tide over the possible misfortunes of a bad year is essential. Two years at an Agricultural College will give a student a good general knowledge of most of the departments of farming, and of the various breeds of stock and their characteristics, but this is not sufficient. Successful farming demands a knowledge of men and markets beyond what can be given at a college, and two or three years spent with a successful farmer is necessary to ripen a student's experience and show him more of the business of farming."

A WYE STUDENT PLOUGHING

On the choosing of the farmer the Principal of Wye speaks the words of truth and soberness: "Owing to the depressed state of farming there are men anxious to eke out their slender profits on farming by 'taking a pupil,' but before deciding on a farm every inquiry must be made as to the position, character, and stability of the farmer. There are two extremes to be avoided—where the pupil is a mere labourer and sees little or nothing of the 'head work' of farm management, and where the pupil is merely a well-dressed spectator who is tolerated, when he cares to come, perhaps on account of his premium." In point of fact, to take full advantage of the occasion, "the pupil should be present at every part of the detail of farm management; he should be there when the cropping is discussed, when the orders are given out for each day's work, at the market or when stock or crops are bought and sold, and he should keep a day-book in which are recorded all details, no matter how minute or trivial, of occurrences in connection with the farm. He should know how each manual operation should be performed, and should carefully study and make himself familiar with

THE HEDGING CLASS AT THE HARPER-ADAMS COLLEGE, NEWPORT, SALOP

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PART OF THE DAIRY AT THE MANOR FARM, GARFORTH (UNIVERSITY OF LEEDS)

the methods of the best workmen in every department."

What will all this do for him? "After having spent two or three years in this manner with a good man, he should be competent to take a farm on his own responsibility, and proceeding at first cautiously, tempering his own ideas by the local experience, and watching his

MAIZE AT WYE COLLEGE

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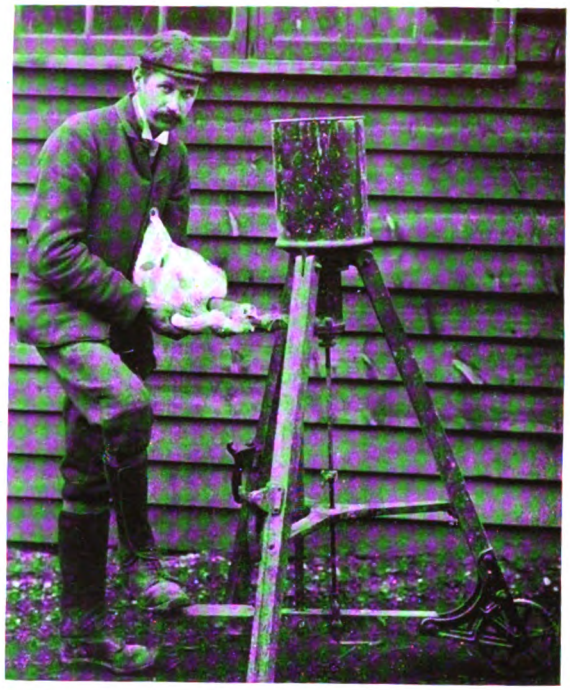
markets, he should develop his speciality, and whilst farming his land to the best advantage, he should gain a name and reputation as a skilful and reliable specialist in what he considers to be a remunerative speciality, whether of stock-breeding or crop-growing."

VIII. The Demand for Agricultural Teachers

Farming in the colonies or in other countries next presents itself, but though Wye has trained many men for this life, I have no space in this article to discuss this branch. Another career for which the College courses, supplemented by special instruction, will equip a student is, Mr. Dunstan explains, that of surveyor under County and District Councils, and he gives some useful hints.

There remains the opening for teachers at the Agricultural Colleges. Like Mr. A. D. Hall and other authorities, Mr. Dunstan is impressed by "a dearth of thoroughly qualified men, well trained in methods of scientific inquiry and familiar with agricultural practice." But "there must be no half-measures if this career is decided upon." "Four or five years must be spent in ob-



CRAMMING A CHICKEN

A demonstration at Wye

A STUDENT'S CUBICLE AT THE UCKFIELD AGRICULTURAL COLLEGE, SUSSEX

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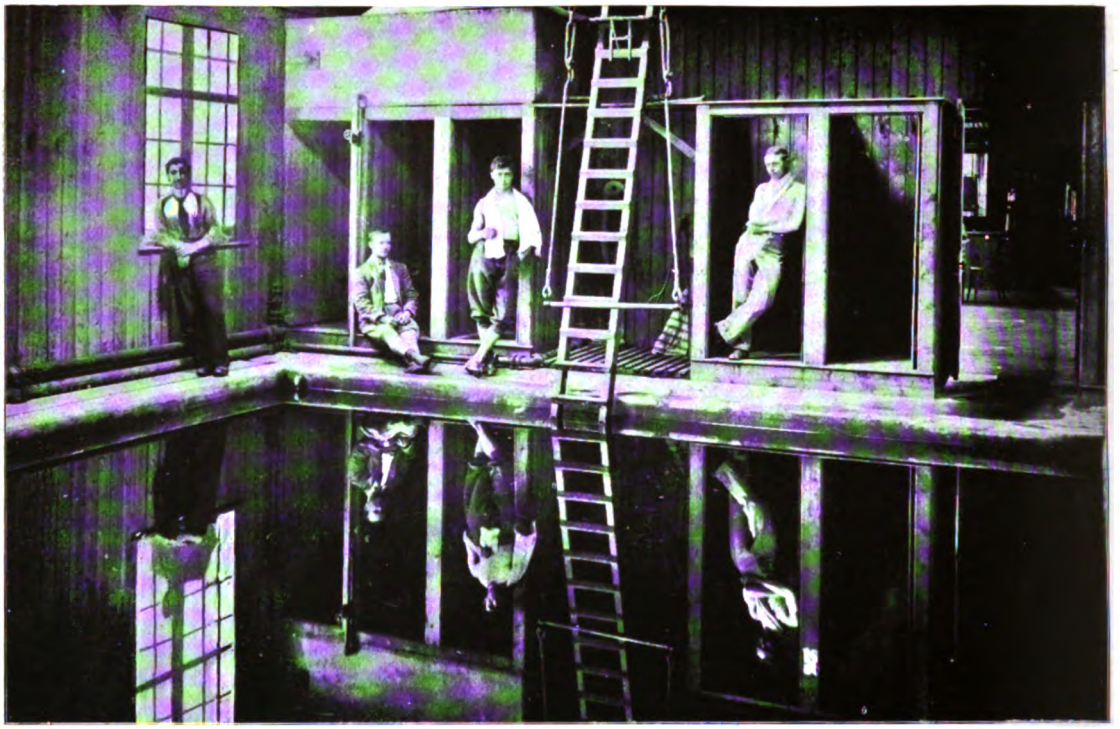

THE PLUNGE BATH IS MUCH USED IN THE SUMMER AFTER A HARD DAY ON THE FARM
The Uckfield Agricultural and Horticultural College and Training Farm

taining a thorough education and experience of Agriculture in some of its scientific aspects. The three years' degree course at the College will enable a student to gain his Bachelor of Science in Agriculture at London University, and this will stamp him as possessed of a good all-round knowledge of the sciences appertaining to agriculture."

But though this sounds fine it is not enough. "The student must determine which particular branch is to be his speciality, and must spend some time in gaining further instruction therein, and must also take care that his practical knowledge is thoroughly sound, as a knowledge of the practical side of farming is necessary for a teacher, not only to fully appreciate the bearings of science on Agriculture, but also to bring his facts in their proper proportions before his students. There are undoubtedly excellent openings in the increasing number of Agricultural Colleges and schools for well-qualified scientific teachers of chemistry, botany, entomology, and the other sciences having a direct bearing on farming. Unfortunately, there is no public provision for research, and the researcher is generally a teacher as well, but a teacher to be thoroughly capable must not

SCALDING MILK-CHURNS WITH STEAM DIRECT FROM THE BOILER—AT WYE

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A VETERINARY CLASS—HARPER-ADAMS COLLEGE

only keep himself up to date in the details of work in his special branch, but must at the same time be an investigator on his own account."

There are, of course, other openings for Agricultural College students—positions in some Government departments, foreign land development companies, &c.—but, as Mr. Dunstan says, the training for these is much on the same lines as for those already specified, and the best grounding for all is a two or three years' course at an Agricultural College.

IX. Brain Work *versus* Manual Work

One of the wilfully provocative things I said to Mr. Dunstan to make him speak his mind to me while we plodded through the chalky mud of his farm-roads that wet afternoon at Wye was that I did not see any of his students being taught the dignity of labour on the land by being made to load dung.

"Of course you don't," he said. "Is a man going to pay College fees to have his son taught to manage a dung-cart? The young fellow who comes to us to study agricultural science comes to us because he hopes to do better work than load dung. He can learn that on a farm at any time, if it is necessary for him to learn that for which there will always be dull and cheap labour. Certainly, we teach our men, as you know, to hold a plough, to harness a team, and so on and so on; but these are incidentals, as it were. Our business is with the brains, not with the hands and backs of our students. The future of farming in this country is not to hands and backs, but to heads. As the farmer I told you of realised, our object here is to teach what cannot be learnt on the average farm."

"Let me tell you another story," the Principal went on. "I was once lecturing on feeding-stuffs, I think it was, to a gathering of farmers. When I had finished and the resolution of thanks had to be seconded, a farmer got up and said he came to the meeting in order to earn a drink. Another farmer had bet him a drink he would not come. So he had come. But

MODEL GARDEN PLOTS AT THE MANOR FARM, GARFORTH (UNIVERSITY OF LEEDS)

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THE FARM HOMESTEAD OF THE UCKFIELD COLLEGE

The area of the farm is 101 acres—one-half pasture and one-half arable land

he did not come with any belief in science. By no manner of means. He went on to say, however, that he had an honest word to speak, and it was this, that if this that Mr. Dunstan had been telling of were science he did not know that he did not hold with it after all, for what Mr. Dunstan believed and what he recommended was exactly what he believed and what he recommended! And surely that is very suggestive. The name of science scares farmers. But what is it but accurate knowledge? We have here departments of knowledge which are of use to farmers. When we are asked, 'What good will it do to send my sons to college?' we say, 'Send them here and we will open their eyes a little. We will show them something about manures that they do not know or give a hint of something about soil they never dreamt of, or tell them something about breeds of cattle and feeding which had not come within their everyday experience. Science does not profess to farm by itself, but it can help the farmer nevertheless.' 'Practice with science,' you know—the motto of the Royal Agricultural Society."

Mr. Dunstan's plain message to the townsman who would turn countryman, in whose interest this article is chiefly written, albeit it nominally deals with the training of and openings for farmers' sons, must be reserved for next month.

[*As this is the time of the year when many people are specially attracted by the notion of possessing a little "property" in the country, we shall publish next month another article by "Home Counties" of service to those who propose to buy or rent a farm. It will include an account of the training given by farmers who take pupils, and "A Plain Message to the Townsman," from Mr. Dunstan and heads of other Agricultural Colleges, and also give some hints as to the way in which townsmen purchasers of farms who elect to go into the country and buy their experience as they go along are likely to fare.*—EDITOR.]

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A VERY WONDERFUL TELEGRAPH

ALL SPEED RECORDS BEATEN—SEVEN HUNDRED WORDS A MINUTE—A NEW FIELD FOR TELEGRAPH WORK WITH CURRENTS OF LOW TENSION—AN ACCOUNT OF THE POLLAK-VIRAG RAPID WRITING TELEGRAPH

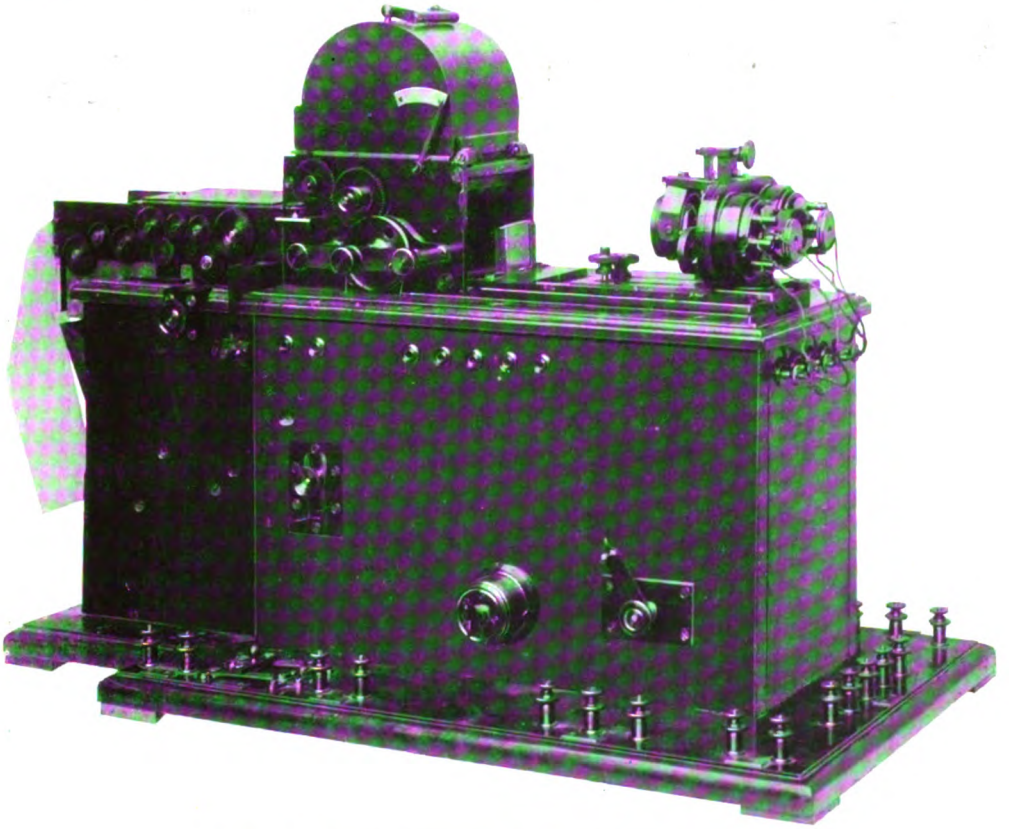
BY

CHARLES H. GARLAND

Illustrated from photographs specially taken for THE WORLD'S WORK AND PLAY

IT is nearly sixty years since Bain first introduced to English telegraph engineers a practical automatic high-speed telegraph apparatus. Despite the high speed which was attained by his Chemical Recorder, however, the faults of the system were such that it failed to commend itself to those responsible for the working of the telegraph service. There is little doubt that if there had been any real necessity for such a system these faults would have been largely overcome, but the bulk of the telegraph work in the forties was not sufficient to warrant the development of any system which was more rapid than the hand-worked Morse.

But of late years a great change has come over the problems which face the telegraph engineer. The volume of telegraph traffic



THE RECEIVER, CONSISTING OF TWO TELEPHONES

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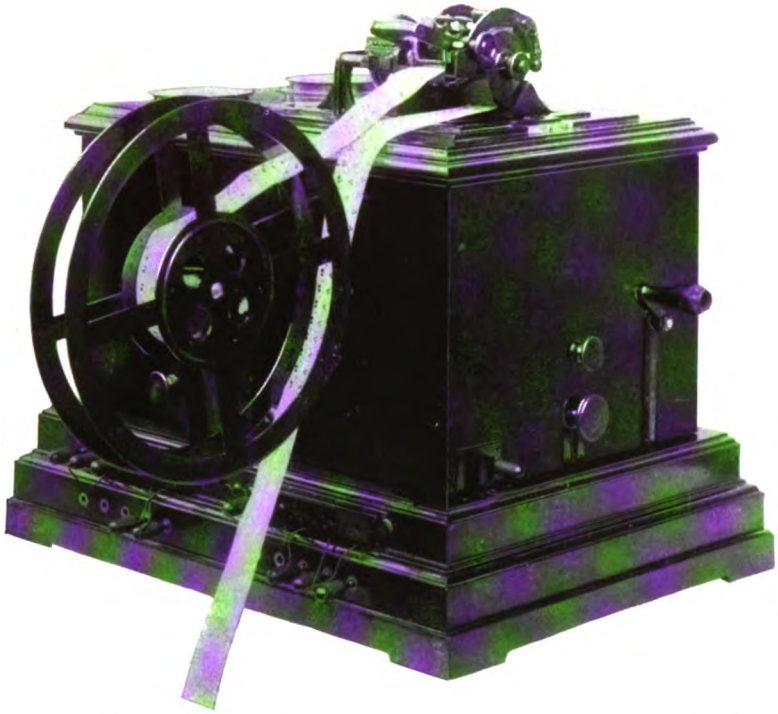
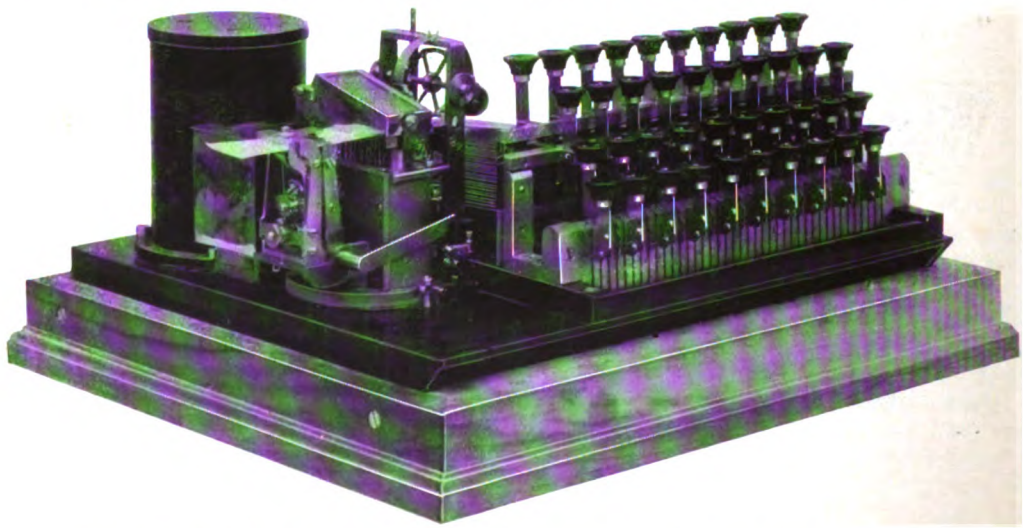


THE TRANSMITTER, IN WHICH THE CURRENTS ARE CONTROLLED BY MEANS OF A PERFORATED RIBBON

has increased to an extent that outruns the utmost capacity of the wires, unless worked on some system that multiplies their carrying capacity far beyond the highest speed attained by the methods of even twenty years ago. And the problem has now been complicated and rendered more pressing by the development of the telephone system. The poles which carry the network of wires through the country are loaded to their fullest capacity, and yet there is a daily growing demand for more "pole space." The peculiarities of the telephone system, which demand a double wire or "loop," in which there is as little as possible of cable or covered wire, put out of court for the present the utilisation for trunk connections of the great underground lines that now run northwards as far as Liverpool. Even for telegraph work it is found much more advantageous to use a "loop" for underground working. So it will be seen that even if construction and maintenance in themselves were not the most serious items of expenditure in a telegraph system, there are reasons in plenty why a telegraph apparatus which promises to increase the carrying capacity of a wire beyond its present limit should attract immense interest in expert circles, and if its results should be sufficiently striking, should even attract a considerable amount of attention among the lay members of the public.



THE PERFORATOR, WITH KEYBOARD ARRANGED AS AN ORDINARY TYPEWRITER

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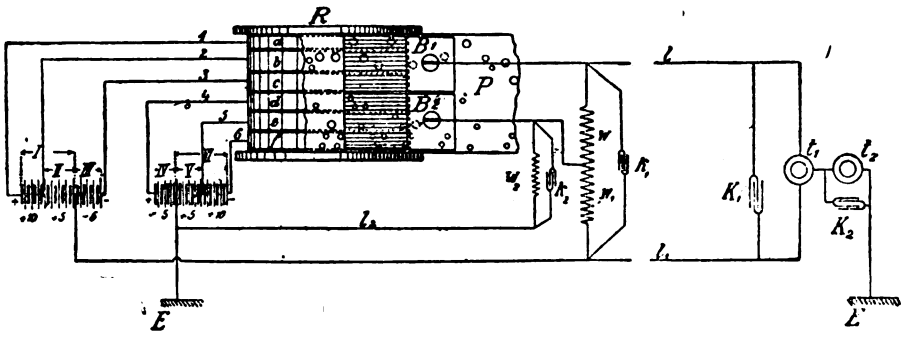
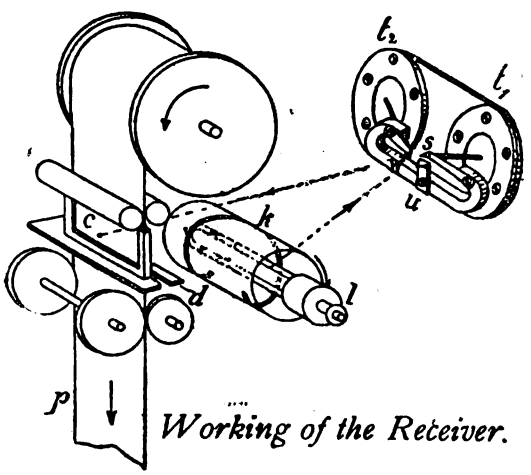
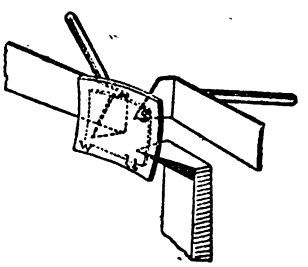


THE ELECTRICAL CONNECTIONS OF THE TRANSMITTER AND THE RECEIVER

When, therefore, it was announced some five years ago that Messrs. Pollak and Virag had perfected a system which could transmit Morse characters at the astounding rate of 1600 words per minute, the scientific world was all agog. In Great Britain a good deal of attention had been given to the development of the Wheatstone automatic system, and by patience and persistence this had been brought to such a remarkable pitch of perfection that as long ago as 1892, 550 to 600 words per minute had been sent simultaneously from Leicester to Birmingham, London, Manchester, and Liverpool. In another direction many inventions had tended to spread out the terminations of the wires fan-fashion so that clerks in increasing numbers could be occupied in direct and simultaneous exchange of telegrams over one and the same wire. The duplexed wire had succeeded the simplex wire and doubled its capacity. To this again had succeeded the quadruplex, which nearly doubled the output of the duplex, and to this succeeded the multiplex, which at one time promised to outdo them all. Now to-day the superimposed circuit gives us six independent channels of communication with only one line. But a speed of 1600 words a minute far surpassed them all. There was, however, a difficulty in the way of success. It is found in practical work that mere speed in transmission is more than counterbalanced by certain concomitant difficulties when the transmitted material requires skilled transcription. This difficulty was found insurmountable in the early Pollak-Virag Telegraph, and after some very interesting and successful trials in Austria, Germany, and America, the inventors turned their attention to altering their apparatus so as to make it write in characters that required no skilled transcription, but which would be plain to any person possessing the very elementary art of reading Latin characters. At the Paris Exhibition of 1900 a description of this system was read by Herr Pinter of Buda-Pesth, and attracted very considerable attention.

Since 1900 the apparatus has undergone considerable improvement; it has been successfully tried over actual working lines in Austria, Germany, and France, and is even now under trial in England.* It was this apparatus that was shown at the Carlton Hotel on December 9 last, in the presence of his Excellency the Austrian Ambassador, and it succeeded on that occasion in transmitting over an artificial line equal to some 250 miles of actual wire plain legible handwriting at the enormous rate of 40,000 words per hour, or very nearly 700 words per minute.





SHOWING THE ATTACHMENTS OF THE MIRROR AND ITS RELATION TO THE OTHER PARTS OF THE RECEIVER

* At the time of going to press experiments are in progress between London and Paris.

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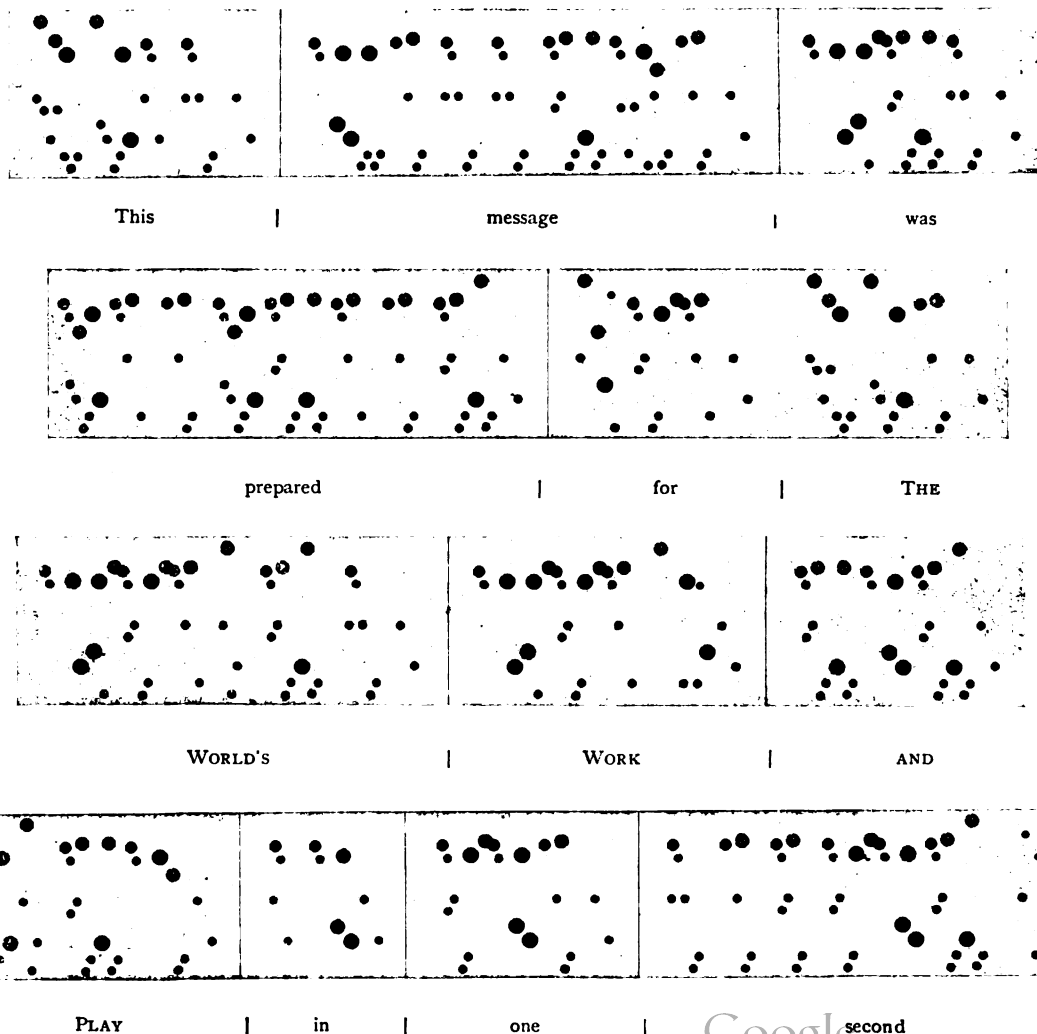
The apparatus by which this remarkable result is obtained is a combination of certain processes of telegraphy, telephony, and photography. There are three separate parts employed: viz., a transmitter, a receiver, and a perforator. The transmitter consists, in its working part, of two series of three discs, insulated one from the other and joined together so as to form a small revolving drum. To the sections of this drum are joined the batteries in such a manner that the power of each disc differs either in strength or direction. One of our diagrams shows these connections. Pressing on this drum are two small flexible metallic brushes (one covering each series of three discs) whose combined width is equal to the total width of the drum. These brushes are joined to the line which reaches the remote or receiving station. If we place between the drum and these brushes some non-conductor such as specially prepared paper, it will prevent contact, and so prevent a current being sent into the line from the batteries which are joined to the discs. But if we perforate the paper in certain places we shall be able to determine by the arrangement of the perforations when the brushes shall come into contact with the drum, which particular section of the drum the brush shall touch, and consequently the strength and direction of the current sent. Further, by regulating the size of the perforation we shall be able to regulate the duration of the current, and the relation of the currents to one another can be regulated by the relation of the perforations on the paper. In the transmitter we have, then, an apparatus which places certain currents perfectly under our control by means of a perforated ribbon.

A SPECIMEN OF THE PERFORATED RIBBON



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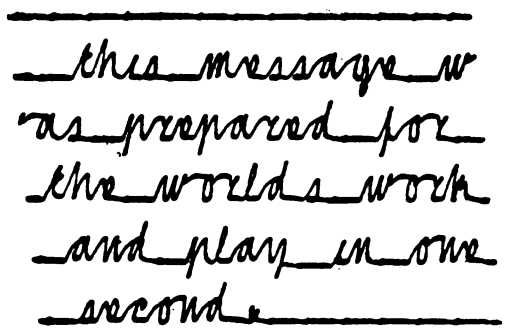
The ribbon by which these currents are controlled is prepared by means of a specially devised perforator. The keyboard is arranged exactly as an ordinary typewriter, and any person able to use a typewriter can prepare the ribbons. In perforating the ribbon the apparatus resolves the writing into two sets of elements: the vertical and the horizontal. By "element" is meant just so much of a letter as can be written by a vertical or horizontal movement of the pen. These elements are perforated, the vertical on the upper moiety of the slip, and the horizontal on the lower moiety. That portion of the slip devoted to each set of elements corresponds exactly in width to half the width of the drum of the transmitter, and is exactly the width of one of the metallic brushes.

The message to be sent having been prepared by the perforator, and placed in the transmitter, the latter instrument sends into the line currents whose strength, duration, direction, and mutual relation are regulated by the perforations on the ribbon or slip.

Let us now turn to the receiver, which receives the currents so sent out by the transmitter and converts them into written characters. This apparatus consists in its working parts of two telephones. The electrical connections of these telephones, which are



THE CURRENTS CONVERTED INTO WRITTEN CHARACTERS BY THE RECEIVER

shown in our diagram, are so arranged that the impulses from one of the metallic brushes of the transmitter actuate one telephone, and the impulses from the other metallic brush actuate the other telephone. These two receiving telephones lie side by side and their diaphragms are connected by tiny rods with a small mirror in such a way that the vibrations of the diaphragms communicate movements to the mirror. The attachments of the mirror are most ingenious, simple, and effective, and merit close attention because of the importance of their work in the functions of the receiver. A strong permanent magnet curved in the form of an elongated **C**, has its extremities produced into three points, two of which are movable. These points are arranged in a triangular fashion, and the movable ones are attached to the rods which come from the diaphragms of the telephones. The mirror is attached to these points by means of magnetic attraction operating on a tiny soft iron plate fixed to its back. The three points by which it is suspended and which can be seen in one of our diagrams, form two axes of movement and provide that the vibrations of one diaphragm communicate to the mirror motions in a horizontal direction whilst the vibrations of the other diaphragm communicate to it motions in a vertical direction. The combination of the two movements gives a motion in a third or diagonal direction, and these combined with the motion of the recording paper make possible all the motions necessary to produce the written characters in which the received message appears.

But the movements of the mirror are exceedingly minute and rapid, their maximum amplitude not exceeding the $\frac{1}{100}$th of a millimetre. It is therefore necessary to have some means of magnifying and also recording the message. This is done by means of a photographic process which is, however, automatic. A ray of light is concentrated on to the mirror and reflected into a small dark chamber in which is a sensitised paper slightly over two and a half inches in width. The angle of incidence of this light ray is changed continually in such a way that the reflected ray passes from side to side of the sensitised paper in a carefully regulated period. The motions of the mirror, communicated to the reflected light-ray and magnified by the distance to which it is reflected write the letters on the sensitised paper which is then automatically carried over into a developing bath and thence into a fixing-bath, and eventually the message emerges in a finished form and permanently recorded after a lapse of only about ten seconds.

What will be the ultimate fate of this system it is yet impossible to say. Whether it can be adapted to the peculiar needs of telegraph work in this country in such a way as to outdo the work of the Wheatstone remains to be seen. But the inventors can claim to have beaten all records for sheer speed, and to have demonstrated effectively a new field for telegraph work with currents of low tension.

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WORK FOR THE WILLING

THE PROBLEM OF UNEMPLOYMENT—FARM COLONIES AND HOW THEY HELP TO SOLVE IT—MR. FELS AND MR. HUNTER ON SUCCESSFUL EXPERIMENTS—MR. PERCY ALDEN'S PROPOSALS—BACK TO THE LAND

BY

GEORGE TURNBULL

OUT of the confusion of dreams and expedients for providing work for the unemployed in this country, one remedy is forcing itself above all others upon the attention of the public. It appeals more insistently each year, gaining new strength and authority with every period of recurrent distress. That remedy is—to find work in the cultivation of the land.

Some small steps in the direction of this solution have been taken. There are several farm colonies in this country at present, doing good work. But they are on so small and so partial a scale that they can only be regarded as something to provide experience against the time when the authorities shall at last come to frame a complete scheme for dealing with the unemployed, and also with the able-bodied men who form so large a proportion of the inmates of our workhouses. These are classes which must, of course, to some extent be considered separately, and it is the latter class which, drawn from one district of London only, forms the material for one of the most notable experiments in farm colonies actually existing to-day, namely that situated at Laindon, in Essex. Mr. Joseph Fels, who inspired the Poplar Guardians to found this colony, has earned the right to be accepted as an authority on the question of how to treat the unemployed by the experience he has had of helping towards a solution of the problem both in his native United States and in England. In Philadelphia, in 1897, he was one of the founders of the association which has since given hundreds of families an opportunity, by the cultivation of vacant lot-gardens, to earn food for themselves on land which otherwise would have lain idle. Mr. Fels is a business man, and the attention he gives to social work is sandwiched in with ordinary affairs in the day's work of his office, situated amid the severely practical surroundings of Finsbury. "As far as I am concerned," he said to the present writer, who approached him there the other day, "the particular thing that is closest to me at present in this question is to get the unemployed back on the land. Not only to farm the land, but to take up such branches as poultry-raising, intensive market gardening, and other employments of that sort. I am simply offering to a few public bodies the loan of land, free of rent, for three years, and at the end of that time they can either purchase it at the price I paid or turn it back on my hands. The only condition I make is that the land shall be thoroughly well cultivated and administered as a farm labour colony for the unemployed, in order to enable those who are not otherwise trained to get a living from the land. The only colony in active work is the one at Laindon. The next is about to be started by Mr. Long's Central Board, and is the property known as the Colonial College, at Hollesley Bay, Suffolk. There are, on this property, buildings large enough to house about a thousand people, including families. There are some 1300 acres, and the ground is at present in a high state of cultivation." While one object of the farm colony scheme is to afford a stepping-stone by which the poorest and most helpless can rise to something better, another object is to reduce the expense these men are to the public when kept in the workhouse. For example, the actual cost of maintenance at Laindon is less than at Poplar Workhouse—and the difference represents a real saving, even if there were no produce from the farm at all. "I take it," says Mr. Fels, "that the saving of the ratepayers' money is the main consideration in the mind of the average man. My plan makes this saving, and at the same time saves the self-respect of the recipient of relief. But I do not believe these farm colonies can be completely successful—especially where they

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deal with workhouse inmates—unless fair wages are paid for the work done. This means a change in the Poor Laws, as the Guardians have at present no right under the law to pay wages." And as he is neither a politician nor a citizen of this country Mr. Fels' final deliverance is of special interest. "You will never get rid of the unemployed," he says, "till the people can get to the land; which means that the land laws need drastic reform."

A farm colony of another type is carried on at Lingfield by the Christian Union for Social Service. Field and farm work, market gardening, and light industries are engaged in by sixty men on a farm of 250 acres. But the character of the material here may be judged by the director's statement that in the whole nine years of the colony's existence he has never had a sober, healthy, skilful, young industrious man. Yet, as we learn from Mr. Percy Alden's most useful and timely little volume, *The Unemployed: a National Question* (P. S. King and Son, 1s. net), Mr. Brooks, the director of the Lingfield colony, claims to have been successful in rehabilitating 33 per cent. of the cases put in his hands. The cost here, though heavy—9s. per week per man, exclusive of clothing—is less heavy than under the Poor Law. With such labour it is impossible to make farming pay, and the chief assets are "the helpless lives made useful, the waste lives reclaimed, the drunkards restored, and mischief prevented." What is true of Lingfield is more or less true of Hadleigh, the Salvation Army colony, where five to six hundred men are employed on agriculture and fruit-farming, market-gardening, dairy work, brickmaking, &c. This colony, Mr. Alden suggests, should be subsidised by the Government as an experimental colony and only one class of men taken. Still another type of colony in England is Libury Hall, Great Munden, Herts, which is under the German Labour Colony Central Board. Here 110 men are taken and set to do farm work, agriculture, gardening, basket-weaving, and carpentry; but the colony is chiefly for Germans, who thus get an opportunity to earn money to pay for their journey back to their native land.

Having visited the labour colonies in Germany, Holland, and Belgium, and having had fifteen years' experience in dealing with the unemployed at home, Mr. Percy Alden is singularly well able to prescribe how far we should follow Continental methods in our treatment of the subject. We may here confine our attention to Germany, which is the most advanced nation in this respect. The opinion of the Board of Trade is unfavourable to the labour colonies of Germany. "Whatever be the object of these colonies," says the Board, "the great bulk of the material with which they deal consists not of efficient workmen out of work, but of tramps, ex-prisoners, and others whose distress is caused by personal defects. They are not colonies of unemployed so much as receptacles for social wreckage." Mr. Alden, too, while seeing the great value of them, lays bare their great defect, namely, the absence of classification:

> "No one can doubt that the very best is being made of the poor material at their disposal by the directors of these colonies, and the one criticism which holds after careful examination is that they have been required to perform an impossible task. If they were established to put an end to the wanderings of the idle and more or less criminal vagrant, then it is unfair to compel a single genuine man to enter. If, on the other hand, the main idea was to help the unemployed who of necessity must move from town to town looking for work, then the issue has been hopelessly confused by the admission of tramp and criminal."

There are signs that the Germans have recognised this weak spot in their system. Meantime, it is interesting to see how Mr. Alden would avoid the German error in a scheme of colonies for Great Britain. He describes the method in the very instructive book to which we have referred. He would have a graded system of farm and labour colonies, including the following types:

> A. A Farm Colony for married and unmarried agricultural labourers or men accustomed to work on the land who have migrated to the town and are willing to return to the country.
>
> B. A Farm Colony for town-bred men, controlled by a large municipality or a group of small towns, or a representative committee covering a fairly wide area.—These colonies would be chiefly for third- and fourth-rate mechanics, crushed out by severe competition, or for unskilled labourers of good character who feel their inability to earn a permanent livelihood in the town. Some of them may have worked on allotments near the town; but the majority would have to be taught the rudiments of agriculture. The colony should therefore be an agricultural training school, so that after a period of probation men may be passed on to colony A.
>
> C. A Colony somewhat of the German

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type, excluding the criminal element and men of bad character.—The colonists would consist in the main of men of the low-grade unskilled, broken down through misfortune, the hopeless and weak-willed men "below par," unable to hold their own in the severe competition of the town. In connection with this colony the labour would be simpler, confined almost entirely to the more elementary work of market gardening, the improvement of land, the making of roads, the trenching of land, and a few simple indoor trades like basket-work, brush-making, and mat-making. . . . The best of the men would again be passed on to colony B.

D. Poor Law Farms for epileptics, inebriates, and the physically defective.

E. Poor Law Colonies compulsory for the vagrant and the wastrel.—The example of the Belgian colonies must not be followed too closely. Every effort should be made to reform the vagabond, so that while compelled to work he may feel that a door of escape into a higher colony is still left open if only he chooses to avail himself of it. Many of our idle ne'er-do-wells are men who have sunk to this low level not altogether as a result of their own evil habits, but partly by reason of the fact that lack of work has caused them to become demoralised and degraded. A certain percentage even of these men might be reformed if properly treated, just as the young criminal is reclaimed by the Borstal system in England or by the Elmira system in the United States.

These, condensed, are Mr. Alden's proposals as regards land colonies, but many other points are worth notice in his suggestions for dealing with the problem of unemployment. He would have a Minister of Commerce and Industry appointed, and a Government Department to deal especially with the question—for it is a national question; Labour Bureaus in every district, where unemployed and employers should be interviewed, advice given, railway fares paid to districts where work is plentiful, &c.; Relief Stations and Labour Homes scattered throughout the country, within walking distance of one day; representative Unemployment Committees or Councils with spending power conferred by legislation to deal with the question over wide areas, and control the relief stations, labour homes, &c., and to have power to call to their aid the trade union leaders—the cost being borne partly by the local authorities concerned, partly by the Imperial Government. He also recommends the reclamation of foreshores and waste land, the building of sea-walls, &c., by a Government Department, on the lines of the experiments made by the Dutch Government; the afforestation of waste land by the Government, a beginning being made with Crown lands, thus creating a new and profitable industry; the improvement of canals and inland waterways—to be purchased by the Government at the present valuation; the reorganisation of the Port of London, carrying out the recommendations of the Royal Commission; Government grants to trade union unemployed insurance, with a view to the encouragement of this form of self-help amongst all grades of skilled labour, the subsidies being proportionate to the contributions of the trade unions; and a shorter working day for all Government and municipal employees. These are the conclusions arrived at by one who has made a long investigation of the subject, who believes the unemployed question is largely an economic question *for which charity is no solution*, and that "it is the first duty of the State, as also its highest and truest interest, to set on foot such constructive reforms as will check the wholesale demoralisation of large sections of the working classes, and restore to the people the assurance so long denied that honest work will carry with it a just and certain reward."

Another believer in State action is Mr. Tom Hunter, a member of the London County Council, who has had extensive experience in the management of men. Mr. Hunter is a firm believer in putting the unemployed to the work of developing the land, "and for that," he adds, "you want Government aid as in New Zealand." The New Zealand Government took up this question very strongly, and in the five years from 1891 to 1896 the Bureau of Industries employed 8981 men in Government relief works, and sent 5139 men to private employers. The best of the New Zealand work was done by gangs of men working on the co-operative system. A small party of men, for instance, is allotted a certain section or length of road or line; one of them is elected a "ganger" and trustee for the others, to deal for them with the Government. The Government engineer states a price for the portion of work, and as this is done by an unprejudiced officer it is generally accepted without murmur by the men. Progress payments are made fortnightly, for the benefit of the men's families, and the whole amount is

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paid in cash on the work being passed by the engineer.

But as this article is giving special prominence to the unemployed problem as touching the land, Mr. Hunter's experiences at Epsom are instructive. On their estate at Long Grove, Epsom, the Asylums Committee of the London County Council have given some months' work to hundreds of men from the ranks of the London unemployed. Mr. Hunter had just returned from the estate when I met him. "There are 850 men working on an estate of 1000 acres," he said. "Many of them belong to the mechanic class, and many of them are country-bred. I have been watching the progress of the work to-day, and I am bound to say I have never been so well satisfied with any body of workmen before. The improvement in the men is marvellous—they feel they are doing good, useful work: hedging, ditching, making water-courses, &c. We have only had to get rid of three men out of the whole 850. By their own desire the men have a religious service every day, at mid-day, at which generally from 200 to 250 men are present. The men are taken from London to Epsom in the morning and brought back to town at night by special contract with the South Western Railway, the men themselves paying 2*s.* a week towards their fare and the Mansion House Committee paying the remainder. They are paid 7*d.* an hour for their work, and have an eight-hour day. The Estate Steward supervises for the London County Council, while the Mansion House Committee find the gangers to look after the men. No loafing is permitted."

From enthusiasm about these genuine unemployed Mr. Hunter turned to the general subject. When he was a boy in Wiltshire small farms and allotments were numerous. Since then—and now—the tendency is towards large farms. "My feeling," says Mr. Hunter, "is that large farms have been a mistake for England; and I know that in Wiltshire the labourers are very anxious to get allotments.

"The question is whether with Government help we should not bring a great deal of waste land into cultivation. Good men are wanted to stop in the country, but there must be some prospect for them other than the workhouse in old age. The pay must be something better than the low pay of the agricultural labourers."

Precisely how low that pay is can be seen by reference to the report by Mr. Wilson Fox just published by the Board of Trade. It is there shown that the average weekly wage of the English farm labourer, including allowances in kind, is 18*s.* 3*d.*; and as it takes 20*s.* 3½*d.* a week to maintain the labourer and his wife and four children, he can only make ends meet by selling his garden produce, or by keeping poultry or a pig. And in the February number of the *Independent Review*, the Rev. Arnold D. Taylor describes the cause of our deserted villages as simply a question of wages. The labourer will not come back from the town to the farm "as a wage-slave at twelve shillings a week, nor at any wage a farmer can pay. He will come as his own master, or not at all." Human material is over-abundant in the towns, while the land is waiting, hungering. A thousand labourers are wanted in South Devon alone.

Enough has been said—much more could be said—to show that in the present state of public opinion the eyes of thousands of intelligent and thoughtful people are turned towards the land—wistfully, expectantly, hopefully. The impulse is the same in the New World as in the Old. "Give every man who wants it a chance to get a home on the land," said President Roosevelt in his last Message to Congress. "We must seek to check the trend of population to the cities and turn it back to the land, and thus safeguard the nation against one of the greatest dangers that now confronts us in the maintenance of our social and political institutions." And the corresponding British sentiment was expressed by Sir Henry Campbell-Bannerman, in his speech at High Wycombe last month. "I believe," he said, "that the future of our country and the future of our race is bound up with the reform of our land system. The time has come for the invasion of England, for the effective occupation and enjoyment of this country by its own people." There are, indeed, two "unemployeds" to be dealt with—the unemployed men, and the unemployed acres.

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A GERMAN LABOUR COLONY

A PICTURE OF LIFE AND WORK AT WILHELMSDORF, THE PARENT OF THE LABOUR COLONY MOVEMENT—HUMAN BREAKAGES AND HOW THEY ARE REPAIRED—ADMINISTRATION, DISCIPLINE, AND RESULTS

BY

WILLIAM HARBUTT DAWSON

AT a time when the air is full of talk of Labour Colonies it is not amiss to recall the fact that just over twenty years have passed since the first colony came into active existence in Germany. To-day thirty-four of these colonies are spread over the German Empire, and they have found imitators in several continental countries—Switzerland, Holland, Austria. Last year 10,307 homeless wanderers were received as inmates of the colonies, and since the movement began no fewer than 151,281 have entered their ever-open portals. Together the Colonies have 3844 places, though on occasion they accommodate a far larger number of men. Every German and nearly every European State—England included—contributes to the year's total; the colonists belong to all trades and even to most professions; they profess all religions and no religion at all; since want and worklessness are the only conditions of admission, and like every great and true movement for the upraising of human kind the distinctive mark of the Labour Colony movement is its utter catholicity.

Merely to mention the foregoing bald figures is to prove the importance of the epoch-making movement which Friedrich von Bodelschwingh, a pastor of the Prussian Protestant Church, inaugurated, when, in 1881, he trekked at the head of a small band of epileptic *protégés* from Bielefeld, in Westphalia, to a barren spot situated eight or ten miles away on the open moorland near the Teutoburg Forest, there to establish in the midst of a wilderness of sand and scrub, a home for the reception of the workless frequenters of the highway and the street. Of this large-hearted author and prompter of so much that is noble and nobly munificent in the philanthropies of Western Germany, let me only say in passing, as one who has experienced his never-failing courtesy, that Pastor von Bodelschwingh still lives to-day in a suburb of Bielefeld, a hale and hearty man of seventy-three, in the midst of the wonderful "colony of mercy" which his efforts, example, and inspiration have created, as full as ever of schemes for the benefit of suffering humanity, as ardent as ever in his enthusiasms, as undaunted in his faith that for good works good ways and means will always be found, and as profoundly convinced that human nature in the lump is good and not bad.

Wilhelmsdorf (so named after the first German Emperor) was the colony thus first called into existence, and for many reasons it may wisely be chosen as an illustration of this system of treating the great question of the unemployed. For being still under Pastor von Bodelschwingh's direct superintendence, it may be said to embody most faithfully the ideas which underlie the Labour Colony movement; its experience is also the ripest, and it is still the largest establishment of the kind. Let me, however, premise that it is the practical rather than the theoretical aspects of the question which it is the purpose of these pages to describe. My object is not to make propaganda for the Labour Colony ideal—the stage of propagandism was passed years ago—but to direct attention to the concrete expression of that ideal; it is not to preach a social sermon, but to draw a picture—the picture of a Labour Colony at work where its purposes and its possibilities have been best understood and most successfully realised. Hence the inner history of this pioneer colony, romantic as it is, must be passed over.

The estate extends to some 1500 Prussian, or nearly 1000 English, acres, and when purchased by the Westphalian Labour Colony Association it consisted of bleak, sterile moorland covered for the most part with stunted wood, which had to be laboriously cleared piece by piece as the land was needed. The surface soil is a fine white sand, very barren in its primitive condition, yet fairly productive

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when worked up and well manured. A peculiarity of the ground was the existence, at a depth varying from one to three feet, of a thick layer of ochre, so hard and impervious that the water collected upon it, making the land swampy in wet seasons. The mode of culture followed was, by thorough trenching, to bring this layer to the surface, where it was found soon to pulverise into the finest earth when exposed to the influence of air and rain. Thorough ploughing then mixed the sand and marl, and made the land at once ready for cropping. This double work of taming the rude primeval soil and then placing it under systematic cultivation has occupied the Wilhelmsdorf workers from 1882 until the present day, and it may be regarded as the economic basis of every agricultural colony.

It is purely an outdoor working colony; arable and dairy-farming, with pig-breeding, being its almost exclusive sources of employment and of wealth. This year the following land was cropped: Oats, fifty acres (Prussian); rye, fifty acres; potatoes fifty-eight acres; turnips, thirty-five acres; clover, thirty acres; besides which 200 acres were in grass, and the wood—of which a large part must always remain by way of protection from the wind—still covers 800 acres. This also is the rotation of crops followed: Mangolds; oats and clover together; two years in clover (the first year green for cattle and the second dry for winter); rye; potatoes; oats; rye; and mangolds again. The live stock consisted at the time of my recent visit of ten horses for draught purposes, six oxen for the same, forty-eight milk cows, twenty-seven young cows, one hundred and thirty pigs, one hundred and twenty hens, fourteen ducks, and an unnumbered stock of pigeons. No sheep are kept. The cattle are a fine lot of animals, which do credit to their guardians. They are housed in one huge shippon, and, German and Swiss fashion, each has her name, which is painted in bold letters upon a metal plate fixed at the head of her stall. Whether in field, yard, or stall, the cows promptly respond to their names, and to the call of Olga, Venus, Clara, Fulda, Herz, Laura, or the inevitable Gretchen, the animal addressed will immediately respond. Not only so, but the whole forty-eight file to their right places in the shippon with a precision quite pedantic.

Important as it is, emphasis is not laid on the dairy as a money-getting branch of the colony, partly because the produce is largely needed for home consumption. Nevertheless, 300 litres of milk are sold daily at the price of three halfpence a litre (about sevenpence a gallon) and half a hundredweight of butter a week at 1*s.* 2*d.* a lb. As far as possible the colony tries to be self-supporting. All the bread consumed — and the hungry appetites of 150 outdoor workers make a huge aggregate —is bought, for though rye, the food-grain eaten, is produced in abundance it is found expedient to sell all that is not needed in the corn, instead of having it ground into flour. On the other hand, all the vegetables and all the meat used are produced on the spot, and the colony can also sell into the bargain. Last year, for example, the potato crop was so heavy that 1700 cwts. could be turned into money; the colony also sold 450 cwts. of hay, 60 cwts. of dessert apples (for which only a pitiable £18 was received), £10 of asparagus; while a very substantial sum is earned every year by the sale of calves, pigs, and fowls.

It is time, however, to inquire into the composition of the colony, its administration, and its discipline. It is expressly laid down in the rules of the Labour Colony Association that the colony is a philanthropic institution, and every resident admitted is required to acknowledge this fact as a part of the labour contract which he must sign on entrance. At the same time though private benevolence—subscriptions, church collections, and the like—contributes largely to the cost of maintenance, material help is received from public authorities, and especially those charged with the relief of the poor, since their responsibilities are greatly lessened where Labour Colonies exist. Entrance to the colony is attended by a minimum of formality. The wayfarer is invited into the office and is there bidden to read the "House Order," and if he is wishful to enter on the conditions therein imposed, he is referred to the director, Pastor Veerhoff, who acquaints himself with his history and after due admonition asks him to sign the "labour contract." As a rule it is stipulated that a man shall remain a certain length of time, though there is no hard and fast rule, and even if he breaks his promise there is neither attempt nor power to bring him back. For all through he is regarded as a free man, and he is treated as such. In practice the average stay is several months, though many stay for a year or two, and one colonist was pointed out to me who had already stayed eight years and would be glad to remain as long again. He was a man of seventy-three years—a drainer of such exceptional skill that he had made himself

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almost indispensable. The "House Order" referred to binds the colonist to render obedience to all officials and the regulations which govern the institution, to observe all prescribed hours, to conduct himself in an orderly and respectful manner, to take his turn at domestic work, and finally to attend church regularly unless prevented by a valid reason. But loyalty to this ordinance depends entirely upon a man's goodwill and his willingness to abide by pledged word, and it is right to say that cases of insubordination and misconduct are very rare. And yet, though the colony is a charitable institution the opportunity is offered the inmates of saving money wherewith to make a new start in life when discharged. The word "wages" is not used, yet a reward of from twopence to threepence a day may be earned after the lapse of a fortnight, and this is placed to each man's account, to be handed to him on leaving, after deduction for new clothes and luxuries (like tobacco) supplied during his stay.

The work is hard but not exhausting. The summer hours are: Rise at 5 A.M; 5.30—coffee, followed by prayers; 6, work begins; 9, a breakfast pause of a quarter of an hour; 12, dinner with a rest until 1.30, offering the opportunity for a quiet smoke; 3.30–3.45, a pause for coffee ("Vesper"); 7, stop work; 7.30, supper, followed by prayers; until 9 the colonists are free to amuse themselves, and at that hour all must turn into bed. The only important difference in winter is that 6 is the hour of rising and 7 the hour for beginning work; only an hour's pause is allowed at noon; and work stops at dusk, supper following at 6 o'clock. The food supplied is simple but sufficient. For early and second breakfast coffee and buttered rye-bread are served; for dinner sausage and a mixture of potatoes, vegetables, and meat (the vegetables being chosen from a rotation which includes cabbage, peas, lentils, and barley); coffee and bread come on again in the afternoon, and the last meal is a rehash of dinner remnants with milk soup in addition. Sunday brings, by way of delicacy, appetising dishes like potatoes and sauce, preserved cucumbers, and stewed fruit. On the whole vegetarianism is at a premium at Wilhelmsdorf.

The appearance of the crowd of colonists gathered before the door of the administrative building for the semi-weekly distribution of tobacco, which fell on the day of my visit, was a study. There were faces of all types—the fair Saxon and the dark French or Slav, faces deflowered by intemperance and those upon which want and disease had set a deep impress; there was the gnarled and wrinkled face of the inveterate vagabond, with a long life of sloth and indulgence behind him, and the smooth face of trampdom's latest recruit, in this case a mere lad of eighteen, who had arrived that morning; there were cheery faces of which it would have been unkind, in the absence of evidence, to think wrong, and sinister, scowling faces whose owners no doubt knew far more of the seamy side of life than they would have cared to own. The colonists, too, are drawn out of all sorts of conditions of society. Naturally unskilled labourers predominate, but representatives of scores of handicrafts and trades, and not a few professions, are always to be found amongst the motley fraternity. At my visit there were two teachers—one able to speak several languages—and the most miserable figure I saw was that of a former pastor, who had held clerical office after due study and examination.

It might be supposed that neither threat nor blandishment would get good work out of bad material like this, but the truth is the very reverse. Many of the colonists never adapt themselves to the serious spirit which reigns within this hive of industry, but the majority fall in at once with their surroundings, and prove amenable to instruction and the encouragement and example of their superiors.

The chief director of the colony, Pastor Veerhoff, lives on the estate, and besides acting as general administrator, he exercises the incumbency of the church which serves both for the colony and the neighbouring population. Beneath him, and directly responsible for the practical oversight of the colony in all its branches, is the House Father, a capable agriculturist, who was trained in Pastor von Bodelschwingh's Deacons' Home. Naturally he has the help of a few overseers and hinds, but the work of the colony, both agricultural and domestic, is done by the men themselves.

We worship results in England. What has Wilhelmsdorf to say for itself in this respect? First let me remark that while the Labour Colony is not intended to settle the unemployed problem, it does profess to ameliorate it. Its main purpose is to remove the necessity for aimless wandering, to take away the excuse for begging; it is a standing invitation to every man with idle hands to get those hands occupied, to every man with empty stomach to come and be fed according to nature's

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good law, whereby the duty to labour and the right to eat go together. It would, of course, be idle to pretend that all the men who seek the colony do so for the sake of employment. Probably it is sheer need and the wish to avoid the police which drive the majority of them to the door of the institution whose motto is "Work and Pray." The House Father will tell you with a chuckle (if harvest be well over) that one of the most trying times of the year for him is the autumn, when the crops have to be gathered in. Just when the oats, the rye, the potatoes, the mangolds have to be housed, an unwonted restlessness is visible and a wholesale leave-taking takes place. Everybody seems to have urgent business elsewhere. "They don't like getting the potatoes up. They go a fortnight beforehand, and outside they even warn their comrades to wait a little —the work will be over in a fortnight or so." "Sometimes," adds the cunning House Father, "we can keep a little work of the kind standing, so they get it after all." And yet not all nor even a majority of the colonists are shirkers. As an evidence of what these men are capable under proper oversight I was shown a new stone building which they had just completed—a substantial, well-found dormitory to accommodate fifty beds.

The permanent influence of the colony's life and discipline upon the character and habits of the men who enter under pressure of need is a question which it is quite impossible to decide by the common method of statistics. That many of the men are helped to secure regular employment by means of the labour registry which is a feature of every colony is a result which may properly be reduced to figures, but of moral influence it says nothing at all. Besides, how decide if the wastrel of a year ago has been reformed or not? For what is reformation? And if the highest standard of regularity, not to say probity, of life be applied here, how many people even outside the Labour Colonies shall stand? Remember that the people who enter these social refuges are for the most part human breakages, men who are physically and morally "unfit"—"worm-eaten," as the House Father of a Swiss Labour Colony once expressively put it to me. It would be strange if of such material a high proportion could at once be lifted to the level of industry and virtue which would satisfy the exemplary rectitude of—shall we say?—the City Temple. I admit it, the percentage of men who are "reformed" is very small indeed; the percentage even of those who bring forth visible fruit of betterment is probably not higher than twenty-five or thirty. Men go out with the best intentions and with an honest resolve to do credit to the institution which has lifted them out of the ditch; yet often enough the ditch claims them again only too soon. The old associations gather round them; the old habits are found to persist; the old instincts prove not to have died but only to have slumbered during their life in the colony: and again and again men whose conduct and demeanour had been exemplary fall back as low as ever, and come back broken in character, shattered in health, a moral wreck.

By way of contrast let me relate the story of a genuine case of reformation as it was told to me. A teacher who had fallen a victim to drink came to the colony, and, after several months' residence left, convinced that he had overcome the old craving. He did not get beyond Bielefeld, however, before he broke out again. He drank himself penniless and then walked straight back to the colony. "Now you must make me work hard" (*stramm*), he said to the sympathetic House Father. "Only work will cure me." For twelve months this teacher toiled on the land like a helot, winning the admiration of his overseers and his comrades alike. Then he took his discharge again, and such was the stimulating effect of discipline that this time there was no relapse. He had regained mastery over himself and he was soon filling a responsible position in a public institution, which position he retains to-day. His story has a curious sequel. The reclaimed drunkard had a friend, likewise a teacher, who was a victim of his old weakness. He sent him to the colony, and after working nearly a year as a labourer he passed out similarly cured and rehabilitated. He, too, is to-day filling a responsible post in a public institution of the province of Westphalia.

The Wilhelmsdorf Colony is, at present, in the interesting though hardly enviable position of a colony which has got to the end of its pioneer work. For twenty years the colonists have been employed in winning the sterile moorland to cultivability and productiveness, and now but little remains to be redeemed and developed. The land can be, and is, put yearly under remunerative crops in the ordinary way of agriculture, but systematic farming is not the sort of work desired or suitable for workers of this kind. Several years ago this contingency was foreseen, and steps were taken to meet it. As land near Wilhelmsdorf

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had become too dear to buy, an entirely new estate was acquired in the province of Hanover, an estate even more sterile and unpromising than Wilhelmsdorf in its early days, and this has been made the centre of a branch settlement, to which all the stronger and more capable men are sent, while the hundred or so acres of land which have not yet been brought under the plough and spade at Wilhelmsdorf are being reserved for the physical incapables, the epileptics, and so forth. The new colony, Freistatt, near Varsel, on the Weiting Moor, is intended to combine both agriculture and industry. The moor has a deep layer of peat, extending from a foot to a couple of fathoms, and at present attention is being directed to the preparation of turf for faggots and the stall. Already Freistatt has a population of between 120 and 140, so that it nearly equals the present colony.

Space fails to write of several institutions on a smaller scale which are carried on as appendages of the Wilhelmsdorf Colony. Such use the lodgers' department, Ararat, where men are received for a payment of 1*s*, or 1*s*. 6*d*. a day; the Home for Inebriates. called Tekoa, with beds for thirty inmates, who are all required to work like (though not with) the colonists; and Friedrichshütte, a similar home for paying residents. But, useful as these institutions are, the great, predominant. characteristic feature of Wilhelmsdorf is still the splendid work it is doing for the reformation of the highway population, of all sections of society the most wretched and the most neglected, a work whose social and moral value cannot easily be over estimated. Convincing evidence of this is furnished by the fact that Wilhelmsdorf has proved the fertile parent of thirty-three other Labour Colonies in Germany—five being exclusively Roman Catholic and managed by Brothers of the Orders—while several more are in course of formation.

TO-MORROW'S WEATHER

PROPHETS WITHOUT HONOUR IN THEIR OWN HOME—WHAT THE METEOROLOGICAL OFFICE DOES NOT PROFESS TO TELL YOU—WHAT IT DOES—HOW THE CLERK OF THE WEATHER WORKS—WEATHER RECORDS FROM JAPAN TO PERU—A NOVEL USE IN THE COURTS

BY

CLARENCE ROOK

JUST half a century has passed since the Board of Trade established a Meteorological department, and gave Government sanction to the scientific study of the weather in the hope that the immediate past in one. place would give a clue to the immediate future of another. For you will not imagine that the Board of Trade of 1854 had any interest in scientific research that bore in no way upon material advantage. Thirteen years later the Admiralty and even the Treasury became converted to belief in a central bureau for weather news, and the present Meteorological Office was established under the control of a committee appointed by the Royal Society. The department is often ridiculed for failing to perform what it does not yet profess to perform. It does not profess to tell you which day three weeks ahead will be the most suitable for arranging a picnic, nor does it even claim at present that its forecast for the next four-and-twenty hours is infallible. But it claims to have made a very considerable advance in knowledge of weather conditions, movements of atmospheric disturbances. changes of temperature, direction of wind and so forth, and from this knowledge it deduces the probable conditions which will immediately follow. The department spreads a much wider net than this, collecting from all parts details—for instance—of sea-temperature, and gathering into a library and boiling down into reports the weather records from Japan to Peru; and it may be that some future co-ordination will reveal some general cyclic law which shall enable us to prophesy the lean and the fat years. So far, however (I am concerning myself with the prophetic side of the department), the Office says only: "From the present conditions that lie before us we infer

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that, unless no hitherto unknown conditions enter, the weather will for the next few hours be as follows in the eleven districts into which we have divided the British Isles." And given the knowledge of existing conditions, the madness of prophesying the weather appears to have method in it—and a curiously simple method.

It was at a dramatic moment that I stumbled into the headquarters of the weather. On an afternoon a sudden and dense fog fell upon me as I walked. I knew I was more or less in Victoria Street, and it struck me that the Meteorological Office was in the same street, and that the officials were always ready to supply the latest information to the public. Moreover, having a sort of general invitation from Dr. W. N. Shaw, the Secretary, who is one of the directors of the Council, I thought it well to go and complain about the matter. A policeman said: "Along them railings on the right." So I hugged the railings, saw "Meteorological Office" appealing in modest type, and plunged into a dim passage. There is nothing imposing in the Meteorological Office but its purpose. The prophets are quite without honour in their own home. Through dark entries one stumbles into commonplace offices—a dozen or more of them; here are clerks working as in a city office; here is a room that clicks with telegraphic records sent over the special wire from the General Post Office; here is a room in which a few serious scientists are working over the statistics of the past; and finally mounting floor after floor of the narrow, lofty building, one reaches the high cave of Æolus, whose name to-day is Mr. R. J. K. Lempfert. Here, under an electric lamp, and facing the curtain of London black fog, sits Mr. Lempfert, studying a large sheet of paper, his pencil in hand.

"What about this fog?" I protested. "What's the meaning of it?"

"This is only a smoke fog," was the reply. "It will probably pass away in an hour or so. There's a wind coming, and that's all that is needed."

The black fog, it seemed, was but the London smoke which could find no other home, through atmospheric conditions, either in the heavens or in the North Sea. How then did Mr. Lempfert know there was a wind coming to disperse it? The map in front of him, with its additions, explained the premises and the conclusion. It was a map of the British Islands, a portion of the Atlantic, and the whole of Eastern Europe. Dotted all over the map were the stations from which weather reports had come in by telegraph. Beneath were carefully written in symbols or figures the direction and force of the wind, the temperature, the weather generally, and the barometrical reading. A glance at the last figure will show the difference between the red ink of a rise and the blue ink of a fall. Thus we have before us the simultaneous conditions from several scores of points an hour or two before. Now for the conclusion from these premises, a conclusion which is not so much a prophecy as a hypothetical inference. This will be clear when you see the next step.

The Clerk of the Weather leans over his marked map and examines the figures. As he goes, he makes circular or parabolic or hyperbolic lines with a lead pencil, now and then altering the incipient circle to an incipient parabola with india-rubber and a correcting sweep. That is simply because he had missed a barometric reading, which turned the geometrical line from the one curve to the other. There is no imagination entering into the forecasts of the Meteorological Office, no poetry in the prophecy. It is a matter of pencil-marks drawn through telegraphed figures; and when the prophet's curves are completed, you realise the principle on which he has worked. For the weather does not play straight, nor does it even play crooked, even in this country of sudden changes. It plays in a curve. The wind that starts from New York does not follow the line of Greenwich to the Far East and round again to raise the skirts at the flat-iron corner of Broadway. It twirls from mid-Atlantic in some sort of curved motion that the Weather Clerk must deduce from places and figures, and may sometimes spin back and catch the British Isles again. From the Atlantic most of the weather comes; and that is the reason why most of the reports reach the Meteorological Office from the West. But now and then the curve brings the conclusion that if nothing strange comes from Munich, the wind will skip round and bring peril from the East.

It is interesting to see prophecy in the making, and to check it. Mr. Lempfert showed me his curves, showed me the previous record on the map of a few hours before. The pencil lines through the figures curved delightfully. Over London there was a point of atmospheric rest—even depression. But—swish—came the pencil mark that followed a windy curve, and relieved London from a fog. For two days the wind had been skipping round a quiet point.

"I shall shift that point there," said the

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Weather Clerk, and I shall send advice to hoist the cone here, and here, and here"—indicating points on our coasts.

The deduction was a simple one, when the premises were given, the minor premise being the twist of the pencil that followed the twirl of the weather about our island home. For the circle of weather that was a few hours ago centred over the Irish Channel was now, clearly enough, travelling south-west. The depression of London would be lifted, and the outer swish of wind—there it is in pencil on the map—will threaten the shipping that sails on the fringe of the movement. So the man on a top floor of a Victoria Street building hoists the cone at Whitby and half a dozen other places. For any seaport village in the British Isles may have the telegram of warning if it will but pay the expenses of the cone by day or the three lanterns at night. Nor is there a fisherman on our coasts who does not look inquiringly for the prophecy.

The statistics from which prophecies are made are achieved very cheaply, and in a large degree from amateurs. There are, of course, the official establishments, such as those at Greenwich, at Kew, the Meteorological station at Valentia, a very important outpost of observation, and the Redcliffe observatory at Oxford sends its regular records. For the rest, the recorders are of all ranks and stations. The Duke of Devonshire sends from Chatsworth, and the list of recorders includes ladies, postmasters, golf clubs, town councils, clergymen, consumption hospitals, gardeners, and Lady Warwick, and behind them all are the observant coast-guards and lightship-men, who, supplied with the requisite instruments, announce what is happening in sun and sea and sky. For the temperature of the sea is of great importance to mariners, who dread a fog more than a storm.

From these statistics the prophetic map is drawn twice a day, and the issue is at the disposal of the public. By ten in the morning the prophet has his statistics at elbow, his conclusion on paper, and his prophecy ready. This or that should be the weather here or there for the next four-and-twenty hours. It is the same at seven in the evening. He simply notes his figures that denote sunshine, sea temperature, rainfall, wind, temperature, barometric reading, draws his curve (casting a balance between the various influences) and foresees that the weather on the left hand will be the weather on the right hand, unless the curve hints that the weather of three days ago is going to make a Parthian shot at us.

As to distribution of prophecy, the Meteorological Office is not exorbitant in its charges. Ten shillings a year will give any West End club the latest forecast; this, with cost of transmission, is enough to supply any private individual with consolation or apprehension; and the newspapers are on the free list. And during harvest time—from the beginning of June to the end of September—farmers and others may have a special forecast issued at 3.30 P.M. at the cost of the telegram. As to the value of these forecasts the average man is somewhat uncertain, and he hears with delight of the Meteorological official who complained that the daily problem of his life was whether he should bring his umbrella to the office or whether he should leave it at home. When you have ruined a silk hat through faith in the published forecast—you remember the false prophecy and resent it. But the Meteorological Office itself has kept a record of its own successes and failures, and during the last ten years it has been far oftener right than wrong. In no one of those years have the "complete successes" fallen below 50 per cent., and the average of "complete and partial successes" is 83 per cent. In the matter of storm warnings despatched to various points about the coast the prophet is very seldom wrong. The warnings amount to five or six hundred a year, and the average for ten years shows that he is right in all but 6 per cent. of the cases.

The carefully collected and tabulated records of past weather which lie in the Meteorological Office have sometimes an unexpected use. That is to say the evidence comes as a surprise to litigants. There is a "running down" case in the Courts, an action for damages for non-delivery, and the shipmaster pleads a fog at sea, adverse winds; you may imagine a hundred cases in which the state of the weather at a given place and a given time is the crucial point. And they occur very frequently in real life. For the Meteorological Office is continually stepping into the witness-box and giving the weather record for the hour and place in question.

After my talk with Mr. Lempfert, I came downstairs into Victoria Street, and wondered if he had shifted his figures far enough, or too far, or just right. As it happened, he was right. I had entered the door in a fog, which you will remember was a matter of an hour or two in prophecy. I emerged from the door into an atmosphere as clear as Victoria Street can supply.

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THE CULTURE OF WATERCRESS

A PICTURESQUE INDUSTRY IN THE VALLEY OF THE COLNE — MODERN METHODS OF CULTIVATION IN WARM AND COLD WEATHER — BEDS AT £60 AN ACRE—THE QUESTION OF CONTAMINATION

BY

W. BOVILL

"When hoary frost hung on each thorn,
Ere night had well withdrawn her gloom,
Poor Phœbe went one wintry morn
From Colnbrook down to Langley-Broom;
When from the brake or from the rill,
Half clad and with neglected tresses,
Her rushy basket tried to fill
With fresh and green spring watercresses."

SO sang G. S. Carey, the son of the author of "Sally in our Alley," some time between the years 1795 and 1800. His muse was, as a matter of fact, aroused by the sight of a watercress gatherer as he was returning to London in the early hours of the morning from Windsor, whither he had gone in the vain hope of obtaining State assistance, on the supposition that his gifted father was the author of "God save the King."

Now, however, all this is changed: the watercress gatherer no longer seeks in wayside brooks and streams for her stock in trade; both in town and country "Erin's daughters of the dewey cress" are practically sights of the past; and the watercress that grows wild in our streams would barely yield a few baskets of all the thousands that daily go to London alone.

In 1808, only a few years after G. S. Carey wrote his song, one Mr. Bradbury began the cultivation of this plant at Northfleet, Spring Head, near Gravesend, afterwards removing to West Hyde, near Rickmansworth, in the valley of the Colne. Since that time the industry has increased a thousandfold; while the methods of cultivation have naturally been improved during the lapse of nearly a century. But on consulting Lowden, who wrote in 1824, it is interesting to note how wonderfully near to the present system were the more advanced authorities of that date.

Most people, even the least well informed, have some rough notion as to the methods of market gardening and farming; still it is remarkable how very little is known either as to the methods or the magnitude of watercress growing. Generally speaking, watercress seems to be regarded as an aquatic plant, that, growing naturally in our streams, is more easily gathered when planted in large and accessible beds; and hence the existence of these beds and their owners. But to be anything like successful, the watercress grower must be as much a specialist as the gardener or the farmer. All waters are not suitable for the cultivation of the plants, neither are all soils; again, the water may be too swift or too sluggish, too deep or too shallow, and while the winter cress will thrive in one water the summer crop prefers another.

The water that flows through a chalk formation with a superstructure of gravel is what the plants prefer most. Beds supplied with water of this quality, which are at the same time well situated for regulating the depth and flow of the water, will find in exceptional cases a tenant at £60 a year per acre. This is certainly a top price, but beds can be obtained from this price down to £10 per acre.

On the farm where the accompanying photographs were taken two distinct sources of water supply are used, the River Colne, and several flowing artesian wells. The former supplies the beds where the summer cress is grown, and the latter those in which the winter cress is raised. It will be well to consider this latter supply and its resulting crops first, as its use undoubtedly constitutes one of the greatest modern advances in this industry.

Watercress, as most people probably know, will not grow in water at a low temperature, and the plants up to a certain point distinctly like heat. Now, in the winter the waters of our rivers and streams are always liable to be too cold for the cultivation of the cress; but if the grower is so fortunate as to be able to tap some strong underground supply with sufficient head to rise to the surface, he will in all probability obtain water sufficiently temperate for the growth of his winter crops.

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The water from the flowing well shown in our illustration does not vary more than two degrees throughout the year, always standing rather over 50° Fahrenheit. The water-bearing strata is reached about 90 ft. below the surface of the river, and the water rises with wonderful force, so much so that a flint stone as big as one's fist if dropped into the bore sinks for an instant, only to be thrown up again and played with on the top of the column as if it were a cork. As to the exact head of water that could be obtained I am unable to speak, but undoubtedly if confined it would be considerable. It may be interesting to note that one watercress grower alone has some twenty of these wells in the Colne valley, all practically as strong as the above; but so apparently inexplicable are the ways of these subterranean watercourses that a well bored not 50 ft. from one of the strongest in the valley not only proved absolutely dry, but the water already in the bed began at once to discharge itself down the bore, which had to be blocked up.

To return to our subject, it will be evident that with an ample and continuous supply of water, at this temperature, watercress can be grown even in the coldest weather, especially as the tops of the plants are at this season covered to the depth of one or two inches. Still, as might be presumed, the heaviest crops will be found nearest the spring head, where the water still retains its natural heat. The contrary effect, however, takes place during the heat of summer, when the water furthest from the well being the warmest, produces the rankest growth. But as the winter or copper-coloured cress, though hardier, is not held in such estimation as the common or green variety, this extra growth is not taken advantage of, the winter beds being taken up for replanting between the months of June and September.

The summer or green cress, as we have seen, is usually grown in water taken from stream or river. In the case of the Colne, the waters of that stream, coming off the chalk beds of the Chiltern Hills, are as suitable as the water from the artesian wells for the growth of these plants, and being at this time of year warmer than the latter, they are, as experience has proved, more fitted for summer crops. Naturally this dual supply entails in some localities a large amount of work, and no small degree of ingenuity in planning the levels of the beds. Again, as in the case of the beds shown in the illustration, where the current in the river is too sluggish for the perfect growth of the cress, a considerable expenditure is called for. The river water, after passing through the beds, being at too low a level to be returned to its original channel, is carried, together with that from the wells, under the bed of the river itself, travelling some distance to find an outlet.

It is not only in the matter of rent and the formation and supply of his beds that the watercress grower needs to put his hand often and deep into his pocket, for the cultivation of his crop is in itself an expensive item. Once yearly at least every bed must be drained, stripped of plants and weeds, thoroughly cleaned and cultivated. This is absolutely necessary on account of weeds and dirt, which, while they obstruct the growth of the plants, are at the same time apt to spoil their delicate flavour. Especially is this the case where beds are supplied with water which is weedy, or charged with leaves or other foreign substances, such beds requiring to be raked, cleaned and weeded constantly with as much care as would be a crop grown on dry land. In replanting the bed, "sets," or cuttings, are used in preference to seed, as with the latter the beds would not come into bearing for a year or more; but it is customary, in order to keep up the quality of the stock, to obtain plants frequently from some other part of the country—a precaution the wisdom of which will be recognised by even the most amateur of agriculturists. All this care and outlay, however, has its reward; five, six or even seven cuts are taken off a well-managed bed during the season, and from the beds of a larger grower, say one cultivating twenty acres, watercress will be gathered every working day throughout the year; a farm of this size sending out as much as four to five tons weekly all through the winter, and infinitely more throughout the summer.

As to gathering the cress, the sight of the workmen as they wade in their long water-tight boots through the luxuriant beds, shearing off the green top with their knives, is a familiar one to most people, and is at the best a simple though often picturesque form of labour. The cress when gathered is either packed in the "flats" or baskets at once, or moved to a more convenient place, where it is tied in bundles. These bundles are now packed in the flats, which are then thoroughly soaked in cool running water before being loaded in the carts. One of our illustrations shows the above process, although at the busier seasons the bundling is usually performed by women, who are paid by the piece.

The waters of the Colne are used on the farm where our photographs were taken, and it is

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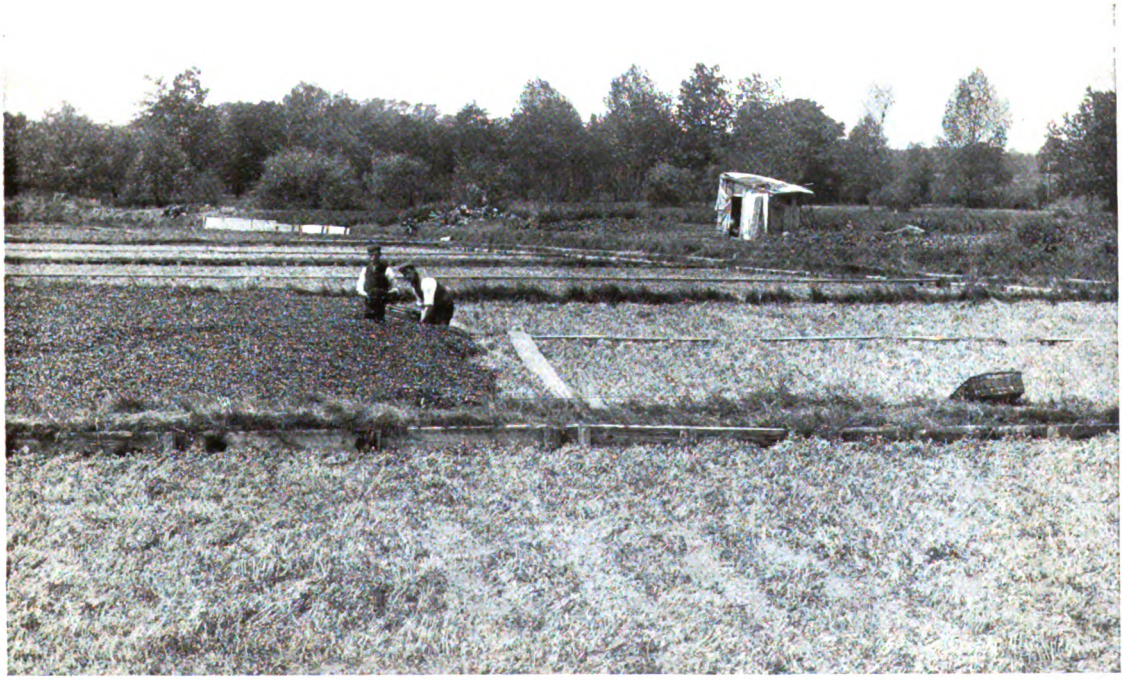
BUNDLING AND PACKING WATERCRESS FOR THE MARKET



GATHERING WATERCRESS

Showing the cut and the uncut beds

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interesting to note that it was in the valley of this river that Carey met his watercress gatherer. No part of England is so famous for its cress as this portion of Herts, nor is the industry carried on, on any large scale at all events, north of the Chiltern hills. So much is this the case that, despite the existence of beds in Yorkshire, Lincolnshire, and elsewhere, the growers in the Basin of the Thames send large quantities of cress to the great cities of the north.

Unfortunately, in any article on this subject it is impossible at the present moment to avoid the subject of typhoid fever. But let the lovers of this dainty and at the same time healthful green-meat take heart; for so long as the plants are grown in pure water, uncontaminated with sewage, the drainage from stables or pigstyes or other animal manures, there need be no fear of contracting this dread disease, and I am informed that the London County Council are already taking steps to protect the public in this matter. It almost goes without saying that the cress will grow more luxuriantly in water charged with any of the above-mentioned impurities than it will in pure water; but it is a satisfaction to know that the flavour of the plant is injured by the process, and at the same time the cress is much more liable to take heat and spoil in transit. While on the subject of forced or manured watercress, it may be interesting to note that some few years ago, at the suggestion of that indefatigable investigator, the late Sir John Lawes, a series of experiments with super-phosphates was undertaken which proved eminently satisfactory, thus placing in the hands of the more advanced growers a fertiliser the use of which, while it is in no way dangerous to the consumer, does not injure the delicate flavour of the cress.

As an agricultural industry it may be said for the cultivation of watercress that it gives employment to many more hands per acre than does ordinary farming, probably more than general market gardening; also, taking all classes of beds into consideration, there are more hands employed in proportion to the capital outlay than in farming. It must be remembered too, that, even were the crops capable of being marketed from very long distances, there is no climate more suited to the growth of the plants than these portions of Great Britain where it is now grown. That the industry has now assumed considerable proportions may be judged from the fact that in South-West Herts alone it gives direct employment to some two hundred and fifty people, and at certain times to a number largely in excess of this figure.

A FLOWING ARTESIAN WELL USED FOR THE WINTER CROP

One watercress grower alone has some twenty of these wells in the Colne valley

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EXAMINING CASES OF WINE IN A "TRANSIT SHED"

THE DAY'S WORK

XIII.—HIS MAJESTY'S CUSTOMS

THE COMPOSITION OF THE STAFF—THE THOUSAND AND ONE TASKS—THE MAIN TASK—SMUGGLING—POPULAR MISCONCEPTIONS—THE COST OF IT ALL

Illustrated from photographs specially taken for THE WORLD'S WORK AND PLAY

THE Customs Department is a model to the world for integrity, and willingness to serve public interests without endangering the Revenue; and the old-time picture of brutal, blustering "Revenue men" is completely out of date. Officers of the British Customs have founded and reorganised Customs Departments in all parts of the world. Most of the Colonial Departments owe their origin to the home country. Siam has an English officer at its head; while to-day rumour has it that India is about to seek British aid in carrying through a thorough reorganisation of its Service.

The great task of the Department is to collect that part of the national revenue which is derived from import and export duties. The head office is in that savoury quarter Billingsgate, where the sober-looking building faces the river between the Tower and London Bridge. Here are the Commissioners—three in number—and the offices of central control. The actual Customs clerical work of the Long Room (the public office of every Custom House is always known as the "Long Room," no matter what shape it may be) is under the control of the Collector.

Throughout the country there are 192 ports, sub-ports and "creeks" (as small sub-ports are called). Of these ports sixty-three are in charge of Collectors, who, unlike the London Collector, have full control of the whole port, and are only answerable to the Board in London. The smaller stations, grouped under District Collectors, are superintended by officers of various grades.

The staff, which last year numbered 4117

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men, consists of three classes:—Indoor, or Clerical; Outdoor; and Waterguard. The Indoor men enter by competitive examination as clerks and work up to senior clerkships or collectorships; the Outdoor begin as assistants and work up through Examining Officerships to Surveyorships and Inspectorships, with here and there a Collectorship. The Waterguard enter as Boatmen and become Preventive Officers and Chief Preventive Officers, with the chance of a few higher inspecting appointments. Each class has its own scheme of entrance examination, and outside influence or patronage play no part in obtaining appointments or promotions, except in the case of Boatmen, who require a nomination from a member of Parliament before they are allowed to sit for their examination.

The big prizes of the Service are few; there are half a dozen or so collectorships worth over £700 per annum, and a few good posts in London; but the bulk of the staff look forward to no more than a fair salary at middle age, with the prospect of a pension on retirement.

It would be impossible, by taking any one officer's day's work, to give the reader an idea of the thousand and one duties that fall to the lot of different officers at different ports in a day. I propose, therefore, to give a general idea of the duties of all Customs Officers, all of which duties will most probably be performed every day—some officer at some port or other doing some portion of them.

IN A CUSTOMS WAREHOUSE

Casting out the content of a cask of spirits by the "head-rod"

We are entering a home port on return from a foreign voyage. It is a misty morning as we drop anchor at the "Tail," and lie waiting the turn of the tide to float our great bulk up stream. We are dreamily gazing over the rail when suddenly a busy little craft shoots out from the haze and bustles up alongside. An alert man in uniform springs aboard and seeks the Master. Customs Officer number one has made our acquaintance. He is a Preventive Officer (a "Waterguard" man), and his mission is to give "pratique" to our vessel. Under the Public Health Act of 1896 all vessels on arriving within the limits of a British port from "foreign," are boarded by a Customs Officer, whose duty it is to question the Master as to whether cholera, yellow fever, or plague existed at the port whence the vessel comes, or whether any such cases of sickness have been, or are, on board. If the replies are unsatisfactory the vessel is ordered to moor at a special station, and the Port Medical Officer then takes charge of her, no person being allowed to leave until he is satisfied that no danger to the public health is threatened. Other cases of infectious disease do not cause detention of the vessel, but the Medical Officer is at once informed. If, however, the vessel is found not to be "infected," the Preventive Officer grants a "Certificate of Pratique," and the ship is allowed to proceed to its discharging berth.

We proceed, when the tide permits, and have scarcely moored when another Preventive Officer and a crew of Boatmen are on board. They carry lanterns and are attired in workmanlike overalls. Their description for the time being is the "rummaging crew."

The Master presents to the Preventive Officer a list of all the dutiable goods in the possession of the crew, and this list is checked with the goods produced, each man declaring to his property. A stated allowance for use while in port is put aside, and the rest is carefully sealed up. And then begins what is, to us, an interesting duty and one that falls in with our preconceived notions of the whole duty of a Customs Officer. From stem to stern the vessel is searched thoroughly for concealed dutiable articles.

Possibly the officers look upon their task from a different point of view, for rummaging is hard work, and dirty work, and work that, moreover, to be successfully carried out, calls for a great amount of cuteness and power of observation. (A keen student of men will

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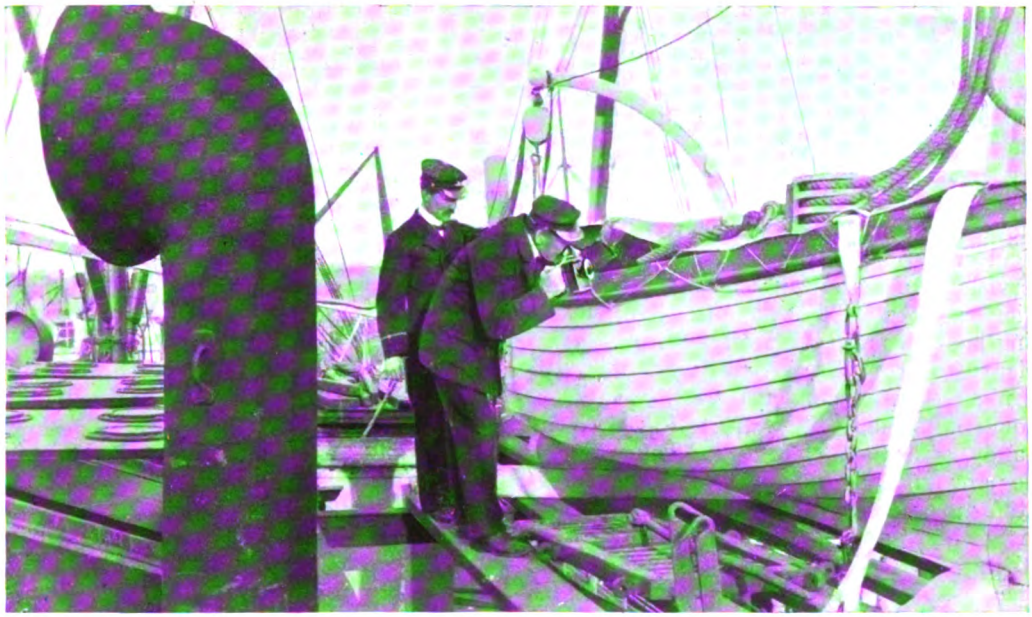

"RUMMAGING"—A LIKELY HIDING-PLACE

probably make more seizures by watching the bearing of the men than by actually searching for hiding-places.) From the cap on the mast-head to the floors of the bunkers there is scarcely a spot that may not be a potential hiding-place for contraband.

Tobacco is the article mostly smuggled, though the high duty on spirits tempts not a few. And one can scarcely credit the wonderful smartness of sailors in devising hiding-places. Tobacco has been found in a loaf, carefully cut open, scooped out, and put together again; at the back of a galley fire, with a shovel of burning coal in front to act as a blind; in dummy blocks hanging in the rigging; in fenders on deck; beneath tons of coal in the bunkers; in blocks of patent fuel; in apparently innocent cans of tinned food, opened and resealed; everywhere and anywhere, in fact, that man's misapplied ingenuity can suggest.

I button-holed the Preventive Officer when he had finished and questioned him.

"Hiding-places?" said he. "I came across a good place last week. We were re-rummaging a steamer, and I was in the engine room. I saw the donkey-man, who was greasing the engines, looking on with a grin on his face; so I took a good look round, but found nothing. I was just turning away when my eye caught a scratch or two above a gauge-case.

"'I want that off,' I said.

"'I can't take it off, and the engineers are all ashore,' said the man, in a very surly tone.

"'Very well,' said I, 'I'll take it off myself.'

"'You'll do yourself a damage if you do,' said he.

"'I'll risk it,' said I; and took it off without any trouble. And there behind the case, if there wasn't a neat hole bored in the plate. I put in my hand and found a string, and on the string a bag, and in the bag 3 lbs. of cavendish tobacco. You should have seen that donkey-man's face!"

"What happened?" I queried.

"I gave him the option of going before a magistrate (in big cases we are bound to take them to Court) or of making a deposit of three times the duty plus three times the value of the goods (an alternative allowed in small cases). In this case the Board, as they usually do—always, in fact, unless there is something very special—made a fine of the deposit and forfeited the goods."

"So that cost him?"

"Fifty-seven shillings" was the reply. "A pound of cigars would cost a man £2 8s., and he would lose his smokes into the bargain. It doesn't pay very well, you see. I knew a boat-man once who found a pound of cigars screwed up in a Dutchman's melodeon. He noticed that a screw was missing from the top of the instrument. Mind you, the thing worked all right and played well enough with the cigars

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in it. That Dutchman made a great fuss over paying up, I can tell you."

"Have you any other duties besides rummaging?"

"Oh, yes. We have to keep an eye on the discharge of bulk cargoes, that is, cargoes not in packages. We have to see that no foreign-travelled dogs or other animals are landed without a licence—that is for the Board of Agriculture. Then there is a certain amount of supervision of coasting cargoes; coal, in particular, gives a lot of trouble. We measure fishing boats before they are registered. There is plenty to do. We have to visit ships day and night—there is always a crew on duty. In some ports the work is very trying. Rowing up and down rivers like the Thames or the Tyne; or knocking about in launches in all weathers; or climbing about bleak quay-sides with ice and snow making the places regular death-traps, is no joke."

The passengers' baggage was being examined in a shed alongside, and I learned from the Preventive Officer that the similar examination that is made at certain of the railway termini is in the hands of the Waterguard Officers.

I cannot forbear making a comparison between British and foreign Customs officers in this matter. Stand at Charing Cross, say, a few minutes before the arrival of the boat train. The officers are quietly waiting. The train comes in and empties its load of luggage. The place is crowded with bags and boxes of all sizes and descriptions. One wonders how many hours it will take to get through such a heap. Hours? In a quarter of an hour or twenty minutes the place is quiet again! And then, with that picture in your mind's eye, call up to your memory the proceedings of the Continental Officer—and bless your stars you were born a Briton. As the London policeman stands alone, so does the British Customs Officer.

"What amount of patrolling the coasts do you do?" I asked.

The officer smiled. "That's from a penny paper, isn't it?" he said. "We don't patrol the coasts. Outside the limits of Customs ports the Coastguard, under the Admiralty, look after revenue interests, unless something of more than ordinary importance occurs, and then a man is sent from the nearest port."

The cargo is being rapidly and noisily discharged from our holds into great sheds alongside. I leave the vessel and enter a shed. Here I encounter a member of the Outdoor Department—an Examining Officer—who with an attendant "Watcher" (an unestablished employee of the Crown) is hard at work examining the goods. Here a package is opened, there a bale is spitted or bored with steel instruments, or split open. All goods—except "bulk" goods, which the Waterguard men look after, pass under this officer's eye, and no single package is removed from the shed without his consent. It is all done very quietly and very quickly; but it is thorough. The chief object of the examination is, of course, to prevent smuggling; but there are other objects to be kept in view also. It is worth noting here that in nearly all attempts at smuggling in merchandise, an alien is implicated.

WEIGHING A CASK OF SPIRITS IN A CUSTOMS WAREHOUSE

When a vessel from "foreign" enters port her Master goes to the Custom House, and in the Long Room makes his "Report," a formal document giving, along with other particulars, an account of the quantity and nature of his cargo, and the

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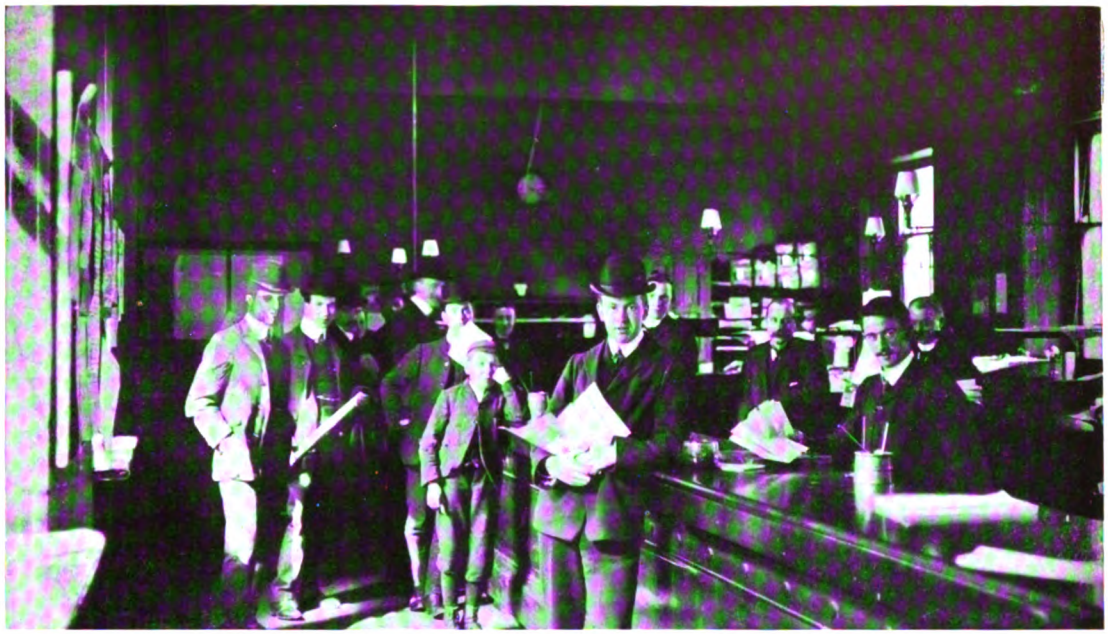

A TYPICAL LONG-ROOM SCENE

number of passengers and animals on board. The Landing Officer (the officer whose acquaintance I have just made) receives a copy of this Report.

At the same time the broker or consignees of the cargo put in forms called "Free Entries" for the non-dutiable cargo. These entries give detailed particulars of the nature, quantities, and values of the goods. The Landing Officer gets the entry, a copy of which is sent to the Statistical Department in London, where it helps in the compilation of those statistics which are popularly known as Board of Trade Returns, because, although compiled entirely by the Customs, they are published by the Board of Trade. Without proper entries vessels are not allowed to commence discharge.

While examining goods for revenue purposes, therefore, the officer has to satisfy himself that the goods landed agree with the descriptions entered. He must be able to identify and classify all manner of goods from all parts of the world. Nor is this merely a question of keeping statistics straight. The officer is responsible for ensuring that the duty is secured on all dutiable articles, some of which are rather difficult to recognise at times. It may happen too that, with no intent to defraud, a merchant may enter as free, goods which are in part dutiable. Some soaps, for instance, have spirit in them; some ordinary commodities, sugar; and the officer has to watch for such things. In cases of doubt he takes a sample for chemical test.

The Merchandise Marks Act, too, throws upon the same officer the burden of preventing the introduction into this country of goods which bear marks implying that they were made in countries other than those whence they come. Traders may register their trade-marks, and goods bearing such marks are not passed through unless they are intended for the owner of the mark. Then there are copyright works to watch for; aliens to be accounted for; explosives to detect; articles that would damage public morals to detain; samples to draw under the Foods and Drugs Act. Truly a Landing Officer needs all his wits about him.

If there are cattle on board there are duties to perform in connection with them. For cattle from some countries may not be imported at all, while from others they may only be landed at certain places in certain ports for slaughter. This is, properly, "Waterguard" work.

The dutiable goods on board may be dealt with in two ways. If the merchant wishes to take possession of his goods at once he passes an entry in the Long Room and pays duty on the nearest approximation to the quantity that he can get. The officer in the transit shed, on getting this entry, calculates the exact duty, and the merchant afterwards gets back what he has overpaid or pays what he has shortpaid.

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Sugar and dry goods generally are weighed and the duty is calculated on the net weights. Wines and spirits in casks are gauged. To see an expert gauger (and gauging cannot be learned in a day, nor a year) with his long and cross "callipers," his "bung-rod" and his "head-rod," is an interesting sight. Long rows of casks fill the shed, and the officer starts at one end and works steadily down the rows, measuring as he goes. He takes a sample from each cask in order to ascertain the proof strength. Wines are tested for strength, while he obtains that of spirits by means of a thermometer, a hydrometer, and a book of tables.

The "head-rod" above referred to is a wonderful instrument serving both for measuring the heads of casks and as a calculating-machin It is an arrangement of sliding-rules covered with figures, by means of which an officer appears to be able to conjure out any calculation you wish in a few seconds, by simply sliding the rules back and fore. It is an application of logarithms to practical use, but it would require a Fellow of the Royal Society to describe it and another to understand the description when given; so perhaps the reader will be content to take my word for its usefulness.

If a merchant wishes to store his goods for future use, he passes another form of entry, which enables him to remove his goods into a bonded warehouse. As a matter of fact it very rarely happens that wines and spirits are cleared immediately; they are nearly always bonded, being gauged either in the shed or, as at some ports, in the bond.

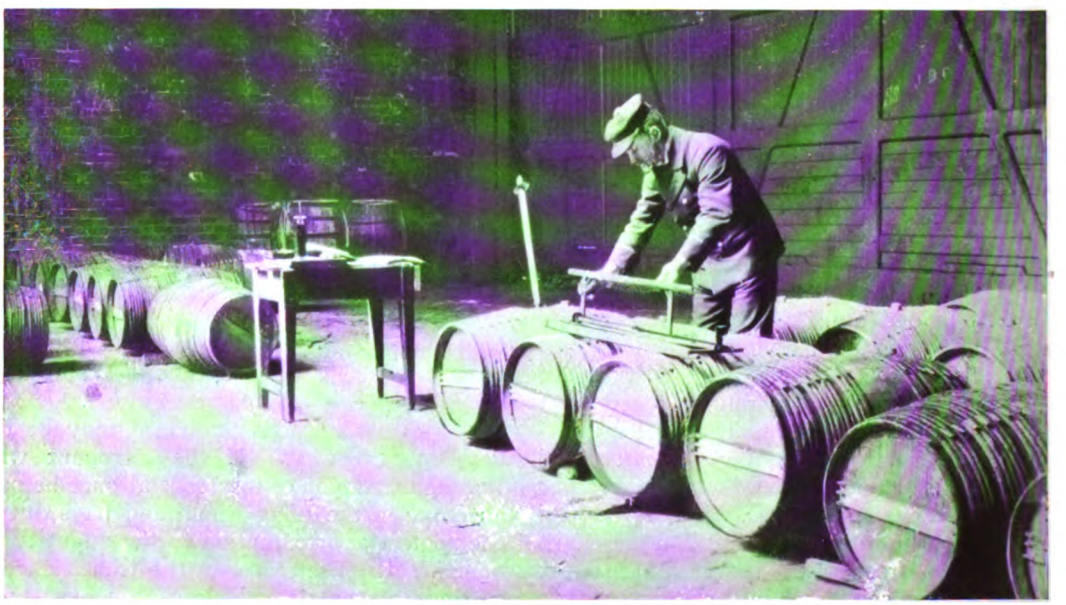
All work is supervised and checked by a superior surveying officer, and a record of all the transactions, together with the documents, is made up in a neat little blue-book and sent to the "Jerquer," a clerk in the Long Room, who "jerques" or checks it.

And now our vessel is empty. The Waterguard crew has re-rummaged her during her stay, and her inward voyage is complete. But cargo is arriving for export, and the officer's supervising eye is still on her.

Outward cargo is accounted for by a document like the inwards entry, called a "specification" (Mr. Chamberlain's "illustrations" as regards exports are founded on this document); and the dutiable goods are carefully examined and checked on board. This because dutiable goods intended for export escape payment of duty—except in the case of coal, which is only dutiable on export—and in some cases allowances and drawbacks are paid.

Having thus seen our vessel away again, let me take the reader for a short visit to a bonded warehouse—the breeding-place of Customs revenue.

A bonded warehouse is a store for the proper conduct of which the proprietor and two sureties have given bond or security to the Crown. The Department requires certain con-



GAUGING CASKS OF WINE IN A "TRANSIT SHED"

Using the cross-callipers

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ditions as to situation and build to be observed, and all operations must be carried out under the supervision of an officer. Duty goods may be placed in bond direct from a vessel or from another bond or a distillery; and may be kept there until required for use, when they may be removed upon payment of duty or for export or removal to another bond. This system is of great advantage to merchants, since they not only have the use of the money they would otherwise have to pay at once for duty, but they do not lose by paying duty on the losses which the mere passage of time causes in the quantity of spirits and such goods. For the Crown has a system of allowances for losses in bond which are naturally caused, and where no suspicion of fraud or tampering arises.

A "BOTTLING-FLOOR" IN A CUSTOMS WAREHOUSE

There are about 1000 bonded warehouses under the supervision of the Customs, and rather less under the Excise. Roughly speaking, the Customs takes all bonds at ports and the Excise all inland. The regulations in connection with Customs and Excise bonds are identical, and exchange of goods is an everyday occurrence.

Bonded warehouses are built for use, not for show or comfort, and they are generally very dark, draughty, and uncomfortable places to work in. On entering one sees tier upon tier of casks or rows of huge vats, filling the mind with a sense of wonder—where does it all go? Here may be found wines from sunny France and Spain or the vineclad slopes of the Deutscher Rhine; brandy from Bordeaux, Spain, California, Egypt and Australia; geneva from odorous Schiedam; rum from the West Indies; best "port" (for invalids!) from Hamburg; whisky from Highland glens (for, although the whisky duty is an Excise duty, the Customs collects a tremendous sum annually on behalf of the sister department); tobacco, tea, dried fruits, sugar; all may be found in bond. And with all the Customs Officer checking, examining, and calculating the duty which the merchant must pay at the Long Room before he can use his goods.

The records or accounts of the goods in bond are carefully kept, so that every hundredth part of a gallon of liquid and every pound of solid is accounted for. It is worth noting that some goods are bought and sold almost entirely upon Customs accounts of weights.

Under the Sugar Convention Bill of 1903 the Customs was given charge of all sugar refineries; the work in these refineries is of much the same nature as that in bonds.

As on landing duty, so in the warehouses, constant alertness and scrupulous exactness are required of the officer.

With this cursory glance at the Bonds (anything like a detailed account of Customs work would fill several issues of THE WORLD'S WORK), we must pass on to view the work of the Long Room, where most of the members of the Indoor staff are to be found.

Here may be seen during a day truly all sorts and conditions of men. Here is the cash clerk taking in money to the tune of some thousands a day. Here seaworn skippers are making their "Reports." Farther along, a clerk is receiving, and checking, the formidable looking "free entries" with their strings of items. Beyond him, another clerk is compiling

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the charges, known as "Light Dues," which are paid by vessels, and collected on behalf of Trinity House, for the support of the "Coast-wise Lights of England." Here are the "Jerquer," the "Searcher," and other mysteriously titled clerks.

A fisherman, smacking of tar and fish, with a slight flavouring of spirits and chewing-tobacco, is registering a new boat. All fishing-boats are registered with the Customs, who allot those letters and numbers that frequently puzzle summer visitors to the sea-side.

Here, too, is the Registrar of Shipping, with whom British floating property is registered at a ridiculously small cost and with so little trouble and formality that the help of a lawyer is unnecessary. Who can say as much for the registration of landed estate? This work, involving as it does questions of law, and the security of large private interests, calls for great care and judgment on the part of the officials.

Collectors of Customs are also "Receivers of Wreck" on behalf of the Board of Trade, and by virtue of their appointments they and their deputies (clerks so commissioned) are empowered to conduct inquiries into wrecks, and cases of disputed salvage; to take sworn statements—they have power to administer oaths in this connection—from persons concerned in shipping casualties; to take charge of wrecks or wrecked property brought ashore; and to perform a number of other connected duties.

At ports where there are no Local Marine Boards the Chief Officer of Customs is also Superintendent of Mercantile Marine, the duties of which office are many and various. They deal with the engagement and discharge of crews; with the management of Seamen's Savings Banks; with the transmission of seamen's wages, &c. The enrolment and payment of men in the Royal Naval Reserve, a very trying duty at big fishing-ports, also falls upon such officers.

"Much to do?" said a clerk. "Of course not. The British Public knows perfectly well that there is nothing to do in the Service, and any amount of pay for doing it."

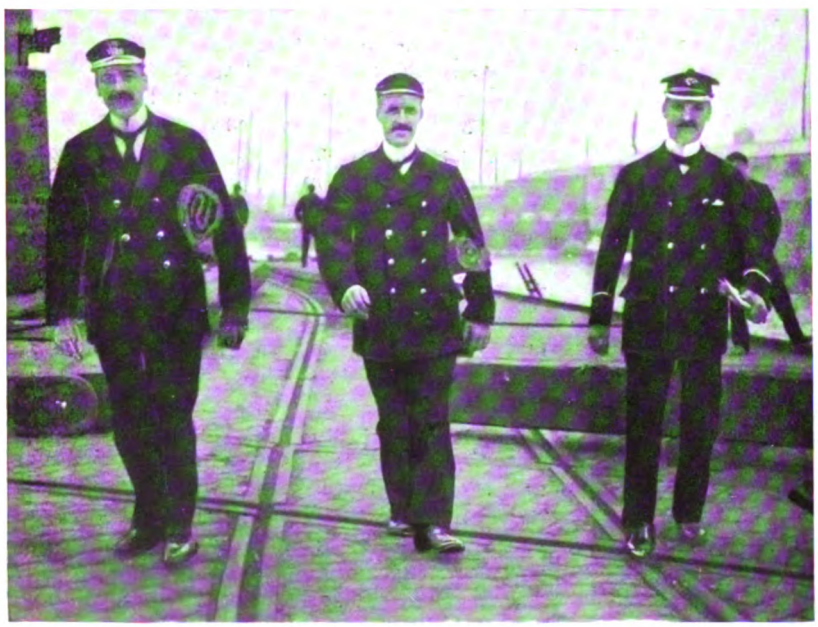
"Smell this atmosphere," he continued; "that's the result of no one being in here all day. The air gets stale."

I fancy that clerk was joking; I should have been confident of it but for the popular belief.

Popular beliefs die hard; but if any one wishes to dispose of his unbelief in public departments let him go to the Customs. A few hours profitably spent at Billingsgate will open his eyes.

Apart from the Long Room work of the Port of London, the big building holds the great controlling, statistical and accounting departments · and one can easily imagine that the work involved in arranging for the proper survey of, and accounting for, the tremendous revenue derived from Customs duties is of considerable magnitude. Many a member of that staff knows what burning the midnight oil means; especially during the trying times of Budget changes, when regulations have to be devised in view of new taxation.

And what is the cost of it all? In 1807 it was £8 0s. 5d. per cent., with a net revenue of £12,720.373; in 1820, £13 6s. on a revenue of £11,969,390; in 1856, £5 13s. 3d. on £23,213,797; and in the year ending March 31, 1903, with a net revenue of £38,746,339 (the highest ever derived from Customs) it was only £2 9s. 3d. per cent. Surely not much cause for complaint here!



A RUMMAGING CREW LEAVING THE DOCKS

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THE CORELESS APPLE

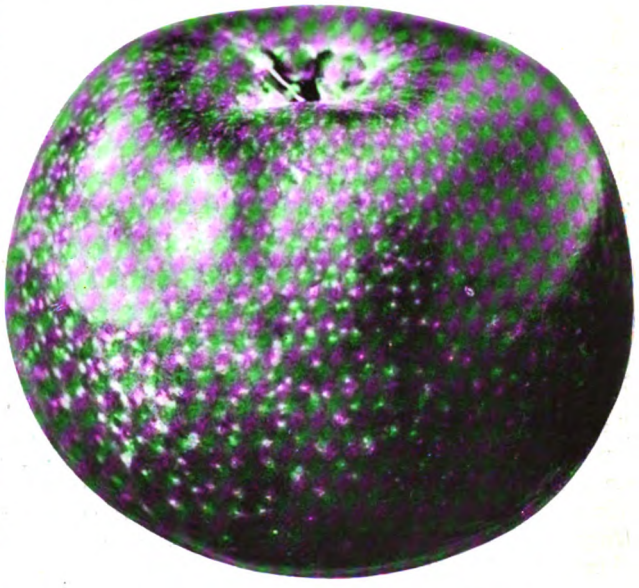
HOW IT IS EVOLVED—A TREE THAT DOES NOT PRODUCE PETALLED BLOSSOM —PROOF AGAINST FROST—POSSIBILITIES FOR THE GROWER

BY

SAMPSON MORGAN

THE arrival of the first coreless and seedless apple in Great Britain has attracted an extraordinary amount of interest, and the mass of correspondence which has come to hand renders it impossible for me to furnish individually the details asked for. I am, therefore, glad to be permitted to set forth authentic particulars of the great pomological curiosity through the widely read pages of THE WORLD'S WORK. On January 22, the first specimens reached me. One of these I forwarded to his Majesty the King, who has done so much by patronage and otherwise for the advancement of scientific horticulture in Great Britain. Photographs were in due course taken of this apple in two positions. The illustrations which accompany this article were produced from the originals and are now published as photographic prints for the first time. The apple, as will be seen, is of fine form. It has a yellow skin, streaked and blushed with bright red, and on the sun side it puts on a dark crimson colour. It is marked prettily with pale yellow dots. The fruit is at its best after the close of the year and possesses a fine flavour. His Majesty's private secretary in acknowledging receipt of the great novelty wrote, "The King has been much interested in seeing the apple which Mr. Morgan sent." The second apple was sent to Sir James Knowles, and the remaining two were presented to the *Daily Telegraph* Shilling Fund for the starving poor of West Ham. They were eventually sold by auction in the Foreign Fruit Market at Covent Garden realising thirty shillings a piece, or at the rate of three thousand shillings a bushel, the highest price ever paid for apples in the world.

The coreless apple-tree does not produce any petalled blossom. In its place is evolved a cluster of green leaves which may best be described as a disorganised bud. It gives off no fragrance, and the destructive Codlin moth passes it by, to the intense delight of the grower. It produces stamens, and possesses a small percentage of pollen. Having no ordinary petals and being a late variety, the tree is practically proof against spring frosts. As fruit gardeners sustain losses every season to the extent of many millions sterling through the havoc wrought by early frosts and the apple boring grub of the Codlin moth alone, the coreless apple-tree cannot fail to commend itself to planters. Mr. John F. Spencer, of Grand Junction, Col., its originator, as the result of the success secured by the seedless orange of commerce, set about the production of a seedless apple. Eventually he got five trees, from which the present stock of over 10,000 was obtained, by budding. The perma-



SEEDLESS, CORELESS, BLOOMLESS

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THE CORELESS APPLE IN THE BASKET SENT TO THE KING

nency of the seedlessness of this apple is undoubted. Being devoid of waste in the form of carpels which constitute the core, the usable fleshy pericarp of the new comer is increased by nearly 25 per cent.

On the continent the probability of the arrival of a coreless apple created unusual excitement. The French growers, whom I greatly admire, have heretofore held the record as regards highest apple values. Their Calville apples, wall grown on trained trees, have made 1*s.* 6*d.* a fruit, equal to one hundred and fifty shillings a bushel. Thanks to the daily Press here that record has been broken. Even the fancy record for pears has been eclipsed by the sale of the coreless apples. The pear record was established early in the eighteenth century by the distribution of the Passe Colmar, through a Middlesex grower. He sold trees of this variety at a guinea each, and single pears at five shillings, in the Grand Row at Covent Garden. The price quoted is at the rate of five hundred shillings a bushel!

From a commercial point of view will the ultimate appearance of the coreless apple do harm or good to the existing industry? It will do good, even when plenty of the fruits are on sale. Large, juicy, aromatic, seedy apples of the special money-making sorts I have always advised should be grown, will under good culture not only pay, but continue to meet a large demand. Between the two, however, the common, harsh, out-of-date varieties will be driven off the market, to the advantage of the skilled grower, and the gratification of every apple eater in Great Britain. When the novelty of the thing has worn off, what effect will it have upon their values? I hardly suppose the coreless apples will then sell at the rate of three thousand shillings a bushel! But I am satisfied that for years in the spring they will command a sovereign a bushel in the markets, provided the quality and size are well maintained. At that price the tree will yield handsome profits as it is a large cropper. This year home-grown Cox's orange pippin apples made that price, so that my estimate is by no means an exaggerated one. At the auction the vast crowd of bidders was told that the name of the buyer of the two coreless apples would "go down to posterity as the purchaser of the first seedless apples that had arrived in Europe," and that the fruits in a few years' time would "become household words." That is good testimony as to their commercial value. When the trees are obtainable they will be high-priced at first. They will be planted as novelties. Then the commercial fruit-growers will take them in hand.

One paper, commenting on the sale of the two fruits, states that "to eat an apple that has neither core nor pips will be a tame business, and that half the joy of disposing of the stolen fruit will have disappeared." Seriously, however, the appearance of the coreless apple proves that nothing can baffle the scientific experimenter. If it gives an impetus to horticultural science in Great Britain, its advent will not have been in vain. It has been suggested that science at its present rate of progress bids fair to bring us round again to the Golden Age, but with this difference that "in the new Eden the apples will have neither pips nor cores."

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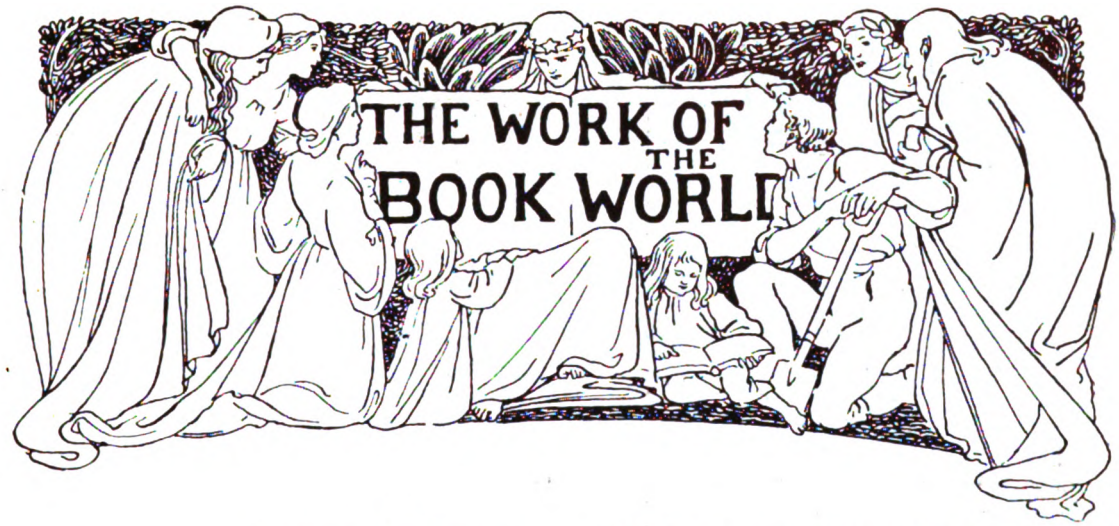

LONDON, *February* 14.

ALTHOUGH this is an age of specialists, when every man's talent is supposed to be bent upon the one thing for which he is best fitted, it is as true now as ever that the successful man in one field is the man who would probably have won distinction in any other. Therefore, one may argue that the winning of high place depends upon personal talents quite apart from professional abilities. All of this because the eminent surgeon, Sir Frederick Treves, Bart., has written a book—*The Other Side of the Lantern* (Cassell, 12*s*. net). It is such a readable book, so abounding in acuteness of observation and felicity of expression, as to impress the reviewer with a sense of the loss to literature which surgery has gained.

SIR FREDERICK TREVES, BART.
("The Other Side of the Lantern")

A Surgeon Globe-Trotter

Sir Frederick is one of the most distinguished surgeons of his time, quite aside from his fame as a successful healer to Royalty; so when he set out upon a world-circling holiday he had all manner of professional as well as social privileges. But these count really for little beside his skill both as an observant writer and as a photographer, for his book is illustrated with the products of his own camera. Perhaps a travel book which covers the well-worn track of the globe-trotter is the most difficult of all books to write nowadays; but the first chapter alone shows that Sir Frederick Treves has succeeded. Here is a description of Tilbury embarkations not unworthy the best of writers:

"Those 'who go down to the sea in ships' go down in a too-animated train filled with restless and disordered folk and their disorderly belongings. Labels, parcels, fragments of refreshments, messages of farewell, unopened letters, and a veritable ruin of flowers hang about these people. From the strange assortment of things they

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MR. G. C. ASHTON-JONSON
("A Handbook to Chopin")

clutch, some of them might be escaping from a modern Pompeii. They have for the most part adopted that ill-formulated clothing which an undecided public considers to be 'suited for the sea'—steamer hats, steamer cloaks, steamer boots. There are women made repulsive by the headgear of men, and sober elders garbed like Captain Kettle. There is such a medley of wardrobes that the most dull of men may appear as compounded of a ship's steward and a deer-stalker, while his wife may have the head of a golf caddie on the body of a cook.

"They talk or laugh or weep in gusts. They exhibit unaccountable impulses and alarms. A man springs up in the carriage with set lips and glaring eyes and pats himself all over in search of a wallet he has already locked in a trunk. A woman, with a glance of terror, plunges into a bag by her side, and claws up its contents as a terrier digs up earth, in a quest as futile as that of the Philosopher's Stone.

"As the train nears the docks it puffs gingerly across many lines of rail, dodging rows of sheds, ramparts of boxes, or barricades of timber. It hesitates many times, going, as it were, step by step, and feeling its way. When the damp quay side is reached, the people drop from the train with such hurry that it might be about to sink into the tide. There is surely not a moment to be lost! They stumble and reel along the dock, dragging bags and rugs, children and trunks, over ropes and chains, round Gargantuan posts, and under appalling cranes. Their hurry and anxiety are such that the train might have come from Sodom or Gomorrah.

"When the ship is gained they still find no peace. They skurry over the deck, up and down the staircases, and along the corridors, like ants in a disturbed ant-heap, and still dragging things. It would appear that there is scarcely a person who has not lost something—a child, or a bundle, or the site of a cabin. The ship is to them a maze with many ends, where all ends are alike. They perceive folk going down a stair, so they press after them. . . . They see food laid out in a saloon, so they hasten to eat it—but absently, with their loins girded and a sense that at any moment they may be compelled to jump up to commence again the blind tramp of the ship."

It is perhaps natural to-day that one should hurry through stirring scenes of Indian life and bright pictures of Indian landscapes and monuments to read of Japan and the Japanese—subjects which it seems cannot be overwritten. As Sir Frederick says, meals in Japan have been frequently described; but if they are all as charming as the one told of here the reader is not apt to tire:

"The meal was served in a small, low room in a garden approached by stepping-stones. Within, the walls were of brown or grey paper screens, while one side was open to the mimic landscape. A kakemona, showing a crow on a bamboo spray, hung from the wall. On the glistening yellow mats which made the floor,

MISS MAY SINCLAIR
("The Divine Fire")

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were four kneeling-cushions. Dining on the floor to a European involves a certain degree of physical endurance, as well as an extended experience of the phenomena known as 'pins and needles.' There is a considerable difficulty in disposing of one's feet, which tend somehow continually to find their way among the bowls and dishes. The dining Japanese, on the other hand, appears to be a creature without legs. Before each of the cushions, on the occasion I have in mind, was placed a bronze charcoal stove, which also had a tendency to force itself as inconveniently upon the notice as did the Europeans' sock-covered feet.

"The serving-maids, who entered noiselessly, kneel before the guests and touch the floor with their foreheads. They serve each dish kneeling, and with the most fascinating grace.

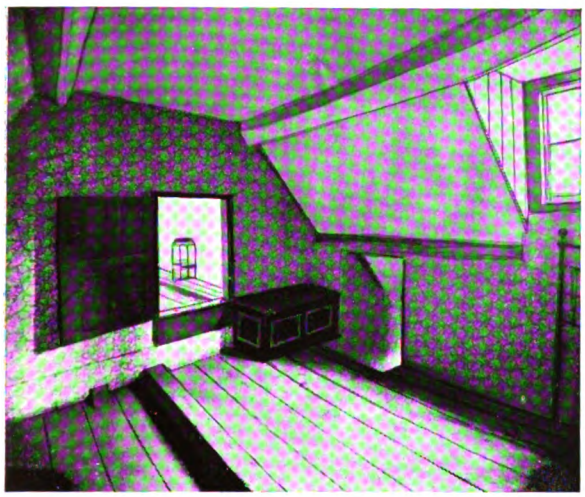
"The first feature in the repast was tea—of the type known as 'tea-ceremony tea.' It is a pea-green mixture, thick, opaque, and frothing, which is served in china-bowls. It is made by whipping tea powder up with warm water. It possesses an agreeable taste suggestive of hay, while with it are brought sweet cakes on a wooden dish. Now before each diner is placed a small black lacquer table about four inches high, on which is deposited a porcelain dish containing raw fish in neat segments, together with horse-radish paste and a minute cup of soy. A fragment of the fish is picked up with chop-sticks, is dipped in the soy and then eaten. Those who express horror at the idea of eating raw fish will consume uncooked caviare with relish.

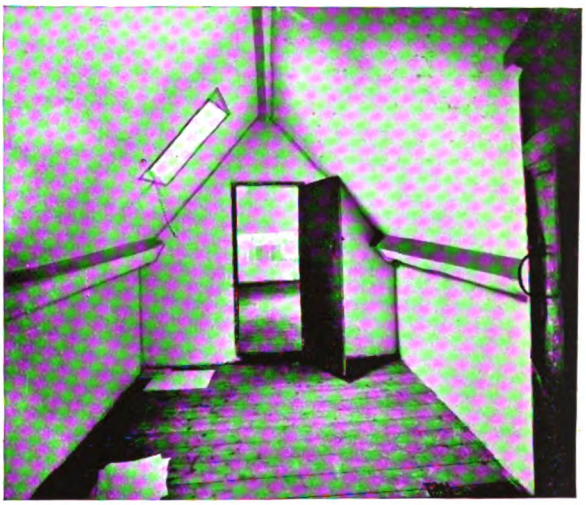
"The course next in order is represented by a lacquer bowl, with a cover, containing rice, together with a like bowl of clear fish-soup, in which float shreds of lotus bulb. The soup is sipped as from a cup. During the meal, saki—a wine made from rice—is taken. It is poured from a porcelain vase, and is drunk from minute bowls with a capacity akin to that of a liqueur glass.

"Now on the table is placed a red lacquer box with a red lacquer lid. It contains eels roasted in oil. These eels are eaten with chop-sticks. Following this appears another basin of clear soup made with lobster, and furnished with pieces of mushroom and sprigs of green. The remaining dishes consist of hot grilled fish in squares, served with sweet cakes, cold crab with ginger-flavour, and finally (as a yielding to the Western appetite) fragments of roast teal with burdock, served with slices of raw apple and orange. As the end of all is a bowl of plain rice and clear Japanese tea. Everything is deposited upon the floor, or on the little lacquer stand, and as no dish is removed, it is *en règle* to return to a particular course at any stage of the meal.

"There is about the whole repast, from the beg nning to the end, something of the little atmosphere of a doll's dinner-party.

"On a public occasion the later stages of the banquet are enlivened by geishas and dancing-girls, whose brilliant costumes create in the room an effect as beautiful as a bank of flowers. In the last act of the dinner for four came the two little waiting-maids, standing at the door of the house before the rickshaws, bowing their heads simultaneously to the ground, with their hands on their knees."





SIXTEENTH-CENTURY ATTICS AT THE SHAKESPEARE HEAD PRESS, STRATFORD-ON-AVON

The house of Shakespeare's intimate friend Julius Shaw is now occupied by the above-named Press, who will issue from it the Stratford Town Edition of Shakespeare's works. These untouched attics are used as "drying-rooms" for the printed sheets of vellum and paper

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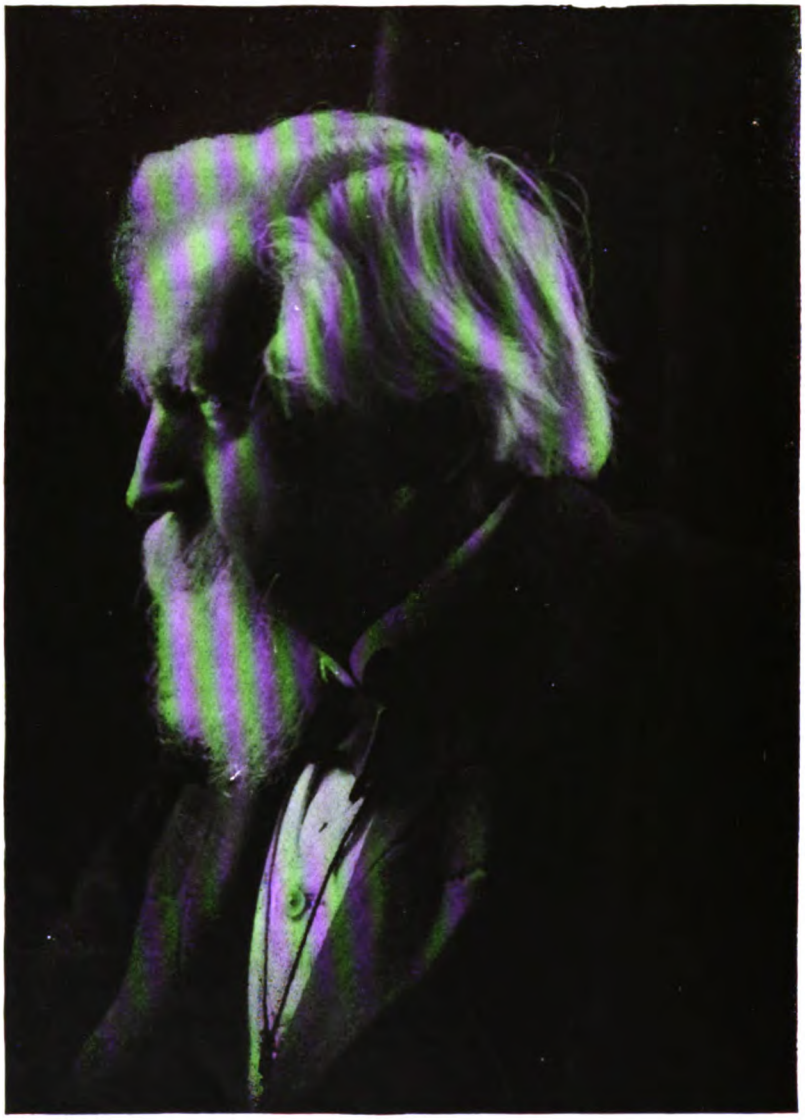

George Jacob Holyoake

Of course, so distinguished a visitor received distinguished consideration, and here are brief paragraphs contrasting the rulers of the East and the West as he saw them :

THE EMPEROR OF JAPAN

"The room in which the Emperor stood, surrounded by the great officials of his household, was small, and lit only from the corridor. It was furnished after the Western style, and had the appearance of a small sitting-room. The Emperor was dressed in a dark military uniform, very like to that of a French General. He is the 122nd member of his family in unbroken line, who has ruled over Japan. His appearance is familiar through public photographs. His face remains immobile, and, if one may say so without disrespect, it is expressionless, impassive, and mask-like. As his Majesty does not speak English, his questions and my answers were interpreted by one of the Lords-in-Waiting. The etiquette of the Court requires that the conversation should be in so low a tone as to be practically whispered. The Emperor was good enough to ask about my journey, and my impressions of Japan. He made inquiries as to the health of his Majesty the King of England, and asked me much as to my opinion of the Japanese military hospitals, medical field equipment, and the like.

"Her Majesty the Empress received me in an adjacent room, in which she had already graciously received my wife and daughter. She was attended by her Lord Chamberlain, and three Ladies-in-Waiting, who were all in European dress. The Empress, whose face is most vivacious and alert, also speaks no language but Japanese. The conversation I had the honour to hold with her took place through the medium of a Lady-in-Waiting and was conducted in a whisper. These royal apartments looked out upon a charming Japanese garden, but they lacked the dignity, the graciousness, and the elemental splendour of the Royal Room in the Palace at Kioto."

MR. ROOSEVELT

"I was presented to Mr. Roosevelt by my friend, Professor J. William White of Philadelphia, who had already made me agreeably acquainted with many of the charms of his great country. As Mr. Roosevelt burst into the room it was

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impossible not to feel that he who had written upon the Strenuous Life, had written upon what he knew. Here was a man of intense vigour and activity, who looked in every inch of him what he is—a strong man. He met me without formality of any kind, but with a breezy heartiness. One could hardly fail to be electrified by his irrepressible energy. Those who know the President of the United States will agree that his face is neither expressionless nor habitually impassive. When Mr. Roosevelt smiles there can remain no doubt in the mind of any that he is smiling. It is the smile of a determined and brilliant man, who has taken no uncertain position among the great influences of the time."

Age Has Not Withered

Vigorous old age is always interesting, always picturesque, and surely among the fine old men yet alive the well-known Radical leader, Mr. George Jacob Holyoake, stands in the front rank. That a man who was born in 1817 should write a book in 1905 is in itself a noteworthy fact. It takes some reflection to realise over what distant periods of our public life Mr. Holyoake's memories run. Some years ago he published with great success two volumes which he called "Sixty Years of an Agitator's Life." But from such a long term of public service there must be a fund of experience and reminiscence sufficient to fill many volumes, and surely these two later goodly tomes give no evidence of exhaustion. Mr. Holyoake calls the book *Bygones Worth Remembering* (Unwin, 21s.), and his first chapter is devoted to a discussion of bygones which should be remembered and bygones which should be bygones. The book could have no better introduction than the beautiful portrait of the old man which serves as a frontispiece. Among the earliest recollections mentioned, for the book is made up of what are evidently notes written from time to time upon various subjects, placed in more or less chronological order, is the author's imprisonment in 1842 for unbelief. This covers a change in sentiment and a growth in tolerance not more strange than the political and mechanical advance which has been made in the author's time. What impresses the reader most is the vigour with which a man of this age retains his old theories, beliefs, even prejudices. Mr. Holyoake has not grown more gentle with advancing years, and does not hesitate to write fiercely and bitterly of people and things to which age or death, if not deserts, has awarded reverence. For instance, in a day so given up to admiration of the career of Disraeli, it is strange to read here bitter taunts and outspoken defamation of his character. But the agitator's life has not been wholly political, and therefore his memories are not wholly partisan. One of the most interesting chapters in the first volume is that devoted to George Eliot and George Henry Lewes. Of the great woman writer he has this to say:

"Some women, not distinguished for personal beauty when young, become handsome and queenly later in life. This was so with Harriet Martineau. George Eliot did not come up to Herbert Spencer's conception of personal charm. One day when she was living at Godstone, she drove to the station to meet Mr. Lewes. He and I were travelling together at the time, and he caused the train to be delayed a few minutes that I might go down into the valley to meet his wife. I had not seen George Eliot for some years, and was astonished at the stately grace she had acquired. One who knew how to state a principle describes the characteristic conviction of George Eliot, from which she never departed, and which had abiding interest for me: 'She held as a solemn conviction—the result of a lifetime of observation—that in proportion as the thoughts of men and women are removed from the earth on which they live, are diverted from their own mutual relations and responsibilities, of which they alone know anything, to an invisible world, which can alone be apprehended by belief, they are led to neglect their duties to each other, to squander their strength in vain speculations, which can result in no profit to themselves or their fellow creatures, which diminish their capacity for strenuous and worthy action during a span of life, brief, indeed, but whose consequences will extend to remote posterity.'"

Evidently strenuous unbelief operated little to raise differences between Mr. Holyoake and so profound a believer as Mr. Gladstone, for the book positively glitters with tributes to the dead statesman's memory. There are many chapters relating to Mr. Holyoake's intercourse with Mr. Gladstone, and each seems to have had the greatest respect for the other's opinions.

"At our last interview he said, 'You and I are growing old. The day is nearing when we shall enter—' Here he paused as though he were going to say another life, but not wishing to say what I might not concur in, in his sense, he—before this pause was well noticeable—added, 'enter a changed state.' What my views were he knew, as I had told him in a letter: 'I hope there is a future life, and if so my not being sure of it will not prevent it, and I know of no better way of deserving it than by conscious service of humanity.' . . . Mr. Gladstone knew early what many do not know

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yet, that courtesy and even honour to adversaries do not imply coincidence of opinion. As I was for the right of free thought, I regarded all manifestations of it with interest, whether coinciding with or opposing views I held. . . . In the splendid winter of Mr. Gladstone's days, there was no ice in his heart. Like the light that ever glowed in the temple of Montezuma, the generous fire of his enthusiasm never went out. The nation mourned his loss with a pomp of sorrow more deep and universal than ever exalted the memory of a king."

How different the tone when Mr. Holyoake comes to a discussion of Mr. Gladstone's long-time adversary. He says:

"Disraeli is a fossilised bygone to this generation; though in the political arena he was the most glittering performer of his day. Men admired him as the Blondin of Parliament, who could keep his feet on a tight rope at any elevation. Others looked upon him as a music-hall Sandow, who could snap into two a thicker bar of bovine ignorance than any other athlete of the 'country party.' He was quite capable of serving any party, but preferred the party who could best serve him. He was an example of how a man, conscious of power and unhampered by scruples, could advance himself by strenuous devices of making himself necessary to those he served. The showy waistcoat and dazzling jewellery in which he first presented himself to the House of Commons, betrayed the primitive taste of a Jew of the Minories, and foreshadowed that trinket statesmanship which captivated his party, who thought sober honest principles dull and unentertaining."

An American Bayard

English people have never failed in acquaintance with or appreciation of the high characteristics of the great general of the Confederate service, Robert E. Lee. Because of their distance from the scene of action and their lack of blind partisanship for either cause, the highest appreciation of General Lee's soldiery has always been held in this country. But up to the present the knowledge has been mainly military knowledge, and the personality of the man has been little known. Owing to Colonel Henderson's brilliant life of Lee's chief subordinate, the name and character of Stonewall Jackson stand out as a more important figure of his time. There is, therefore, ample place for the volume entitled *Recollections and Letters of General Lee* (Constable, 12*s.* 6*d.* net), written by his son, Captain Robert E. Lee. There is something inexpressibly lofty and pure in the life record of this chivalrous Southern gentleman. He seems to have lacked altogether the fierceness, the impetuosity, of his colleagues in the great struggle which the Southern states carried on for the preservation of what they considered inalienable rights. There is much of the lofty calmness of a Washington about General Lee, a likeness which perhaps comes easily to mind from the fact that he married a grand-daughter of Mrs. Washington. Captain Lee's recollections of the early life of his family, their beautiful home of Arlington, opposite Washington on the Potomac River, give an insight into a great Southern home at a time when such homes were all that is ideal. At that time the father was an officer in the United States army, and one of the most moving passages of the book is that describing his decision to resign from the service in order to remain with the people of his native state, Virginia, rather than be forced to draw arms against them. A letter to his sister written on April 20, 1861, best expresses his feelings:

"I am grieved at my inability to see you. I have been waiting for 'a more convenient season' which has brought to many before me deep and lasting regret. Now we are in a state of war which will yield to nothing. The whole South is in a state of revolution into which Virginia, after a long struggle, has been drawn; and though I recognise no necessity for this state of things, and would have forborne and pleaded till the end, for redress of grievances, real or supposed, yet in my own person I had to meet the question whether I should take arms against my native state. With all my devotion to the Union and the feeling of loyalty and duty of an American citizen, I have not been able to make up my mind to raise my hand against my relatives, my children, my home. I have therefore resigned my commission in the army, and save in the defence of my native state, with the sincere hope that my poor services may never be needed, I hope I may never be called on to draw my sword. . . . I know you will blame me; but you must think as kindly of me as you can, and believe that I have endeavoured to do what I thought right."

Among the letters of General Lee one is given which seems to throw a new light upon history. It is dated February 25, 1868, three years after the war was ended, and is addressed to Senator Reverdy Johnson at Washington. After speaking of a recent debate in the Senate, General Lee says:

"I desire that you may feel certain of my conduct on the occasion referred to (the time of his resignation from the United States army)

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so far as my individual statement can make you. I never intimated to any one that I desired the command of the United States army in the struggle which seemed impending; nor did I ever have a conversation with but one gentleman, Mr. Francis Preston Blair, on the subject, which was at his invitation, and, as I understood at the instance of President Lincoln. After listening to his remarks, I declined the offer he made me, to take command of the army that was to be brought into the field; stating as candidly and as courteously as I could, that, though opposed to secession and deprecating war, I could take no part in an invasion of the Southern states. I went direct from the interview with Mr. Blair to the office of General Scott; told him of the proposition that had been made to me, and my decision. Upon reflecting after returning to my home, I concluded I ought no longer to retain the commission I held in the United States army, and on the second morning thereafter I forwarded my resignation to General Scott. At the time, I hoped that peace would have been preserved; that some way would have been found to save the country from the calamity of war, and I then had no other intention than to pass the remainder of my life as a private citizen. Two days afterwards, upon the invitation of the Governor of Virginia, I repaired to Richmond; found that the Convention then in session had passed the ordinance withdrawing the state from the Union; and accepted the commission of commander of its forces, which was tendered me."

Fascinating Essays

Mr. Lewis Hind is one of the most literary writers of our time, in the strictest sense of this much-abused word. He writes pure English, simple English, strong English; his outlook upon life is acute and original. If he were not so modest and so punctilious about his work his output would not be so small in volume. His latest book, *Life's Lesser Moods* (A. and C. Black), is a couple of score sketches, or experiences, or glimpses—one hardly knows what to call them. But their charm, sometimes their pain, is fascinating, and every page is a model of good style. Anybody who cares for real literature will experience a rare delight in reading them.

A Musical Guide-book

Mr. G. C. Ashton Jonson will be remembered by readers of THE WORLD'S WORK for his striking article in its first number entitled "Music and Mechanism," an article which has had echoes in many parts of the world. His *Handbook to Chopin's Works* (London: Heinemann, 6s.) is a musical "Murray" of a new type—a handbook to all the works of the most brilliant musician that ever lived, compiled and written with perfect sympathy and great knowledge and conscientiousness. Mr. Ashton Jonson describes it as "for the use of concert-goers, pianists, and pianola-players." All these classes will welcome it, but perhaps the last-named the most. For now that the pianola has brought the most technically difficult compositions within the reach of the least technically gifted, the intimate study of difficult music is no longer a privilege of the few. With this book it is possible, without being able to play a note upon the piano, to acquire such a thoroughly sympathetic knowledge of Chopin as a few years ago only really gifted pianists could achieve. Mr. Jonson writes picturesquely and sometimes even passionately, and draws his illustrations from a wide field of literature. In his preface he says:

"This book is not intended to be read straight through and then placed upon the shelf. It is a handbook, a guide through the 'Thoughtland and Dreamland' of Chopin's kingdom.

"Students of Chopin have already written voluminously about him, and in their writings are many pearls of criticism and gems of sympathetic insight; but these are scattered through innumerable volumes, magazine articles, and newspapers, and are therefore inaccessible to all but the most devoted students.

"I have tried to collect all such passages of the greatest value, and I have grouped them under the opus numbers of the works to which they refer, so that they are here presented for the first time in their natural connection, and are available for instant reference.

"The main portion of the book consists of a brief account of each composition, its relative place amongst Chopin's works, its distinguishing features, notes of any special point of interest attaching to it and an epitome of the comments or criticisms that have been made upon it by all the great writers, critics, biographers, and *virtuosi* who have written about Chopin and his works.

"Although I have begun with a brief sketch of Chopin's life, and short preliminary chapters on various aspects of the composer, this book is in no sense intended as a biography; whenever the events of Chopin's career exercised a palpable influence over his works, I have endeavoured in my comments to emphasise the fact, but any attempt to write a biography when such a work as Professor Niecks' Chopin is in existence would be lost labour.

"Three years ago this book could only have met with a very limited demand, owing to the fact that the number of amateurs possessed of sufficient technique to play Chopin's music (for the most part extremely difficult) is very small.

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"But to-day, owing to the invention of the pianola and the fact that all Chopin's works, including even the least important of the posthumous compositions, are now available for that instrument, the whole domain of his music is for the first time open to all. Those who wish may pass the portal hitherto guarded by the dragon of technique, and roam at will in his entrancing music-land.

* * * * *

"Rubinstein, the greatest artist among pianists, says, 'The Pianoforte Bard, the Pianoforte Rhapsodist, the Pianoforte Mind, the Pianoforte Soul is Chopin. Whether the spirit of this instrument breathed upon him, or he wrote upon it—*how* he wrote for it, I do not know, but only an entire going-over of one into the other could call such composition into life. Tragic, romantic, lyric, heroic, dramatic, fantastic, soulful, sweet, dreamy, brilliant, grand, simple, all possible expressions are found in his compositions, and are all sung by him upon this instrument in perfect beauty.'"

There are many interesting biographical notes concerning the great composer. Here is one about his unhappy visit to England:

"The revolution of 1848 broke out in Paris, and Chopin came to England. He stayed in London till the summer, when he went for a tour in Scotland with Mendelssohn.

"It is a curious fact that they are the only musical geniuses to have visited that country. Poor Chopin was very ill at this time. When he played in London he had always to be carried upstairs to the first floor, and in Scotland he complains incessantly of the weather, which he said was killing him. He found nothing to his taste and declared all Scotch women were ugly. Mendelssohn, however, said 'he should like to become a Turk, and settle in Edinburgh.'

"During the whole of his stay in England his health became steadily worse. Towards the end, the self-control and reserve of the sick man began to give way. He writes from Dover Street to his friend Grzymala: 'A day longer here and I shall go mad or die'; and again: 'I have never cursed any one, but now I am so weary of life that I am near cursing Lucrezia' (George Sand).

"The anonymous generosity of Miss Stirling, his Scotch pupil and hostess, saved Chopin from actual want and discomfort, for, of course, with the inability to teach, compose, or play, his income had almost entirely ceased. He resigned himself to the prospect of death with a noble courage, and was tenderly nursed by his sister and his faithful friends Gutmann and Franchomme. To the latter he murmured towards the end: 'She always said I should die in no other arms than hers.' When he was almost *in extremis*, George Sand came to the landing outside his door, but Gutmann, fearing to agitate the dying man, refused her entrance.

"The anecdote of the Countess Delphine Potocka singing to the dying composer is undoubtedly true, but there is the most extraordinary discrepancy in the accounts of those who were actually present as to what she sang."

Mr. Ashton Jonson says in the preface that if the reception of this book shows that it fills a want, he proposes to write similar handbooks to the other great composers. There can be no doubt that such a book will be vastly welcome to all music-lovers, and when such a series is complete everybody who cares for music at all will want it upon his music-shelves. This volume can be most cordially recommended, and it is to be hoped that its successors will not be long delayed.

A Simpler Henry James

A new novel by Mr. Henry James has never ceased to be cause for congratulation among the select company of his faithful followers. Yet it is true that this company has narrowed as the years went on, and the master became more and more confirmed in his idiosyncrasies of style and method. When, therefore, Mr. James seems, as in his latest book, *The Golden Bowl* (Methuen, 6s.), to have returned to an earlier and simpler period, a wider circle of readers than usual is directly and happily concerned. This novel contains a distinct and clear story, easily followed and filled with none of the vague uncertainties of action or character so noticeable in recent works from the same hand. It would be too much to say that readers will enjoy the story, for it is distinctly an unpleasant one, but no one who has the slightest appreciation of literary art can fail to delight in the manner of its telling. Mr. James is the founder of a school which has to-day many brilliant disciples, but none of them, not even Mrs. Edith Wharton, has yet attained the dry brilliancy of his analysis and subtle insight. It is a curious school in the sense that its characters seem to live more in the mind of the writer than actually of themselves. Great novelists have often maintained that they were powerless in directing the careers of their characters, and that, once begun, a book carried itself to its own end. This is never true in Jamesland. Neither is it a stage for scenes. Great opportunities for melodramatic situations are constantly missed, and the reader of many books cannot but note how much more concerned the author is with what his characters think and what they say than with what they do.

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In the hands of any other writer *The Golden Bowl* would have been dramatic to a degree. It is the story of an Italian prince and his English sweetheart, who, realising that they cannot marry each other, marry respectively a billionaire American widower and his daughter. Of course, this leads to a horrible situation in the love-affair between the prince and his step-mother-in-law. But the whole situation is so delicately carried out, with none of the fury and bombast one might expect to accompany such a plot, that the characters seem but passive agents in the hands of fate, or rather of Mr. James, and the whole story clears itself out in the end in the grey and ineffective way that life usually designs.

The Merit of Miss Sinclair

It is always interesting to observe the ways and means by which true merit comes into its own. No one wonders more often than the reviewer why it is that bad books so often sell well, and good books fail to attract either appreciative or remunerative notice. And surely every reviewer wishes that the good books sold better and the bad books would disappear altogether from the field of notice. No appreciative reader who has read one of the novels of Miss May Sinclair will have forgotten them or will have ceased to wonder at the comparative obscurity of their reception. Both "Mr. and Mrs. Nevill Tyson" and "Two Sides of a Question" found but few, if fit, admirers; yet they were both well worth while. Now Miss Sinclair comes forward with a long novel called *The Divine Fire* (Constable, 6*s*.). which has been received with acclamation by one section of English readers, if not the other. Literary America has risen almost to a man to greet Miss Sinclair and to acclaim her as a genius. The book has already appeared over there in several editions. Editors of American magazines are besieging the lady for contributions, and American publishers, to use an American expression, are "falling over themselves" in the effort to secure her next book. All this may be taken to heart as a moral by English readers and reviewers. Miss Sinclair has written the most distinguished study of London life which has appeared in a long time. Her picture of the Cockney bookseller with poetry in his soul and a fearful muddle of aitches on his tongue is one that will probably take a permanent place in the gallery of current literary characters. It is a dull world, a world of Bloomsbury lodging-houses, of Paternoster Row bookshops, of the reading-room of the British Museum, but it is illuminated by the "divine fire" of inspired description until it gleams long in the reader's memory.

A Novel on Religious Celibacy

There could not possibly be a greater contrast to the school of Henry James than is furnished by the first novel of Mr. E. Temple Thurston. This gentleman is husband to the lady who wrote so excellent a first novel in "The Circle," and so sensational a thriller in "John Chilcote, M.P." Mr. Thurston's style is that of his wife's second book rather than of her first. *The Apple of Eden* (Chapman and Hall, 6*s*.) is crude, garish, prurient even, but strong. Mr. Thurston has not yet learnt the delicacies, either of language or of reserve. Yet he has a good story to tell, and tells it in a way, however roughly, which leaves a fixed impression. That it is a novel with a purpose is, of course, against it from the standpoint of art. That this purpose is denunciation of religious celibacy leads it still further into the field of questionable choice. The story is that of a young Irish priest who cannot understand the trouble that women make in the world—trouble constantly reaching him through the medium of the confessional. Of course, in time so ignorant a man must needs meet with an awakening. How the young priest met his doom, and what happened thereafter, it would not be fair to tell here. It is sufficient to say that the average reader will follow the unwinding of the plot with great interest, leaving not a line unread. And what average reader asks more?

Mr. Benson's Summer Story

One seldom meets with a novel which seems so wholly misplaced as to publication time as Mr. E. F. Benson's latest, *An Act in a Backwater* (Heinemann, 6*s*.). If ever there was one, this is a novel for a hammock on a summer's afternoon. It differs very widely from Mr. Benson's last—and to our mind his most notable—achievement, "The Challoners." It tells a rippling little story of life in a cathedral town, a life as shallow and as devoid of serious undercurrents as that of any backwater could be. There are here all Mr. Benson's old-time felicitous character-sketches, which, slight as they often are, never fail to amuse. In fact, one of the gravest charges which can be brought against Mr. Benson is that his secondary characters are often more real and always more amusing than his hero and heroine. This is distinctly true of the new novel. The characters that remain in one's mind are not the daughter of

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the impoverished peer whose coming makes such a stir in local circles, nor her impetuous artist lover from London, but the puritanical mother of the hero, the pompous Colonel of Volunteers who assumes a military swagger and speaks vaguely of service in India, the very sane maiden aunt of the heroine, and most of all, perhaps, the two elderly spinsters whose hearts flutter so furiously over the very trifling events related of the life and love of the peer's daughter. No doubt, ancient Winchester will recognise and laugh over its own portrait, even if it fail to remember the one single stirring incident of the book, a typhoid epidemic dragged in by force as it were to prove the courage of the heroine. Decidedly, this young lady is too superior, but the record of her small affairs abounds in charming pictures well realised, none more delightful than the scene by the mill where the hero surprises her and paints her unawares, and none more moving than the solemn preparation for death on the part of the pathetic little spinster who largely brought about the exhibition of this unauthorised portrait.

Grim and Powerful

It is a far cry from the over-sensitive people of Mr. James and the quiet conventionalities of Mr. Benson to the rude dwellers upon the good red earth of Devon who people the pages of Mr. Eden Phillpotts' *The Secret Woman* (Methuen, 6s.). Mr. Phillpotts here reaches his highest level, an altitude of which he may well be proud. His book has altogether the grand air, and need only fear to suffer when it meets with its almost inevitable comparison by the side of the books of Mr. Thomas Hardy. In all that concerns the character of his people and the unfolding of his plot, Mr. Phillpotts need fear little from the comparison; but neither in his style, which often seems precious and laboured, nor in his descriptions of nature as an auxiliary force, does his work realise the beauty of Mr. Hardy's. The story of the dull and unresponsive farmer's wife, who surprises her husband's infidelity, and murders him because of his love for the "secret woman," even though she does not love him in the least herself, is drawn out terribly to its uttermost ending. The great desire of the murderess to give herself up to trial and to secure public justification for her undiscovered crime, kept secret at the instance of her two sons, is a power which has moved many revelations in the world of crime, and it is here handled in masterly fashion. Mr. Phillpotts has gone a long stride ahead.

Homely Business Philosophy

Readers of THE WORLD'S WORK AND PLAY are already familiar with the sort of advice which in a former popular volume of letters the Self-Made Chicago Merchant gave to his son. This more than up-to-date Lord Chesterfield has been writing again, and the new book, *Old Gorgon Graham* (Methuen, 6s.), shows no falling off in either the force of his admonitions or the quaint manner of their expression. The author, Mr. G. H. Lorimer, is, as many people know, not a Chicago merchant at all but the editor of the *Saturday Evening Post* of Philadelphia, and is but another example of the fit interpreter which journalism furnishes to many a class that might otherwise remain mutely inglorious. In this book the father leads the son along the thorny path from an underclerkship through various managerships to a partnership in the pork-packing firm already so famous, and also gives much homely advice upon another and more sentimental partnership into which the young man enters during the course of the book. Upon the subject of family relationships in business the pork-packing philosopher delivers the following *obiter dicta:*

"A fond father and a fool son hitch up into a bad team, and a good business makes a poor family carry-all. Out of business hours I like you better than any one at the office, but in them there are about twenty men ahead of you in my affections.

"It's been my experience that when an office begins to look like a family tree, you'll find worms tucked away snug and cheerful in most of the apples. A fellow with an office full of relatives is like a sow with a litter of pigs—apt to get a little thin and peaked as the others fat up. I want you to get this firmly fixed in your mind, because while you haven't many relatives to hire, if you ever get to be the head of the house you'll no doubt marry a few with your wife.

"For every man that the Lord makes smart enough to help himself, He makes two who have to be helped. When your two come to you for jobs, pay them good salaries to keep out of the office. Blood is thicker than water, I know, but when it's the blood of your wife's second cousin out of a job, it's apt to be thicker than molasses—and stickier than glue when it touches a good thing."

Old Mr. Graham feels very strongly upon the subject of letters of introduction, having just suffered, while doing a cure at Karlsbad, from one given by his son to an old college friend.

"Right here I want to caution you against giving away your signature to every Clarence and Willie that happens along. When your name is

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on a note it stands only for money, but when it's on a letter of introduction or recommendation it stands for your judgment of ability and character, and you can't call it in at the end of thirty days either. I reckon that the devil invented the habit of indorsing notes and giving letters to catch the fellows he couldn't reach with whisky and gambling.

"Of course letters of introduction have their proper use, but about nine out of ten of them are simply a licence to some Clarence to waste an hour of your time and to graft on you for the luncheon and cigars. It's getting so that a fellow who's almost a stranger to me doesn't think anything of asking for a letter of introduction to one who's a total stranger. You can't explain to these men, because when you try to let them down easy by telling them that you haven't had any real opportunity to know what their special abilities are, they always come back with an, 'Oh! that's all right—just say a word and refer to anything you like about me.'

"I give them the letter then, unsealed, and though, of course, they're not supposed to read it, I have reason to think that they do, because I've never heard of one of those letters being presented. I use the same form on all of them, and after they've pumped their thanks into me and rushed around the corner, they find in the envelope: 'This will introduce Mr. Gallister. While I haven't had the pleasure of an extended acquaintance with Mr. G., I like his nerve.'"

Finally, the young man reaches a position full of authority over the thousands of men under him, and the father, in discussing the subject, lets fall words of wisdom which many an employer in real life would do well to take to heart. In one place he declares:

"Noise isn't authority, and there's no sense in ripping and roaring and cussing around the office when things don't please you. For when a fellow's given to that, his men secretly won't care a cuss whether he's pleased or not. They'll jump when he speaks, because they value their heads, not his good opinion. Indiscriminate blame is as bad as indiscriminate praise—it only makes a man tired.

"I learned this, like most of the sense I've got—hard; and it was only a few years ago that I took my last lesson in it. I came down one morning with my breakfast digesting pretty easy, and found the orders fairly heavy and the kicks rather light, so I told the young man who was reading the mail to me, and who, of course, hadn't anything special to do with the run of orders, to buy himself a suit of clothes and send the bill to the old man.

"Well, when the afternoon mail came in, I dipped into that, too, but I'd eaten a pretty tony luncheon, and it got to finding fault with its surroundings, and the letters were as full of kicks as a drove of Missouri mules. So I began taking it out on the fellow who happened to be the handiest, the same clerk to whom I had given the suit of clothes in the morning. Of course, he hadn't had anything to do with the run of kicks either, but he never put up a hand to defend himself till I was all through, and then he only asked:

"'Say, Mr. Graham, don't you want that suit of clothes back?'

"'Of course, I could have fired him on the spot for impudence, but I made it a suit and an overcoat instead. I don't expect to get my experience on free passes. And I had my money's worth, too, because it taught me that it's a good rule to make sure the other fellow's wrong before you go ahead. When you jump on the man who didn't do it, you make sore spots all over him; and it takes the spring out of your leap for the fellow who did it."

TEN YEARS' NATIONAL PROGRESS

INCOME HAS INCREASED 56 PER CENT. AND EXPENDITURE 60 PER CENT.—A GREAT INCREASE IN PIGS AND TRAMWAYS

BY

HAROLD MACFARLANE

TEN years in a nation's history is merely a bagatelle, but even in so short a period it is possible for many remarkable changes to occur, as an examination of the recently issued Statistical Abstract speedily makes clear.

Governmental works bound in covers of a cerulean hue are not as a rule regarded as light reading, but it is none the less true that a vast quantity of interesting data is to be found in the latest edition of the Abstract, especially when the reader institutes a comparison

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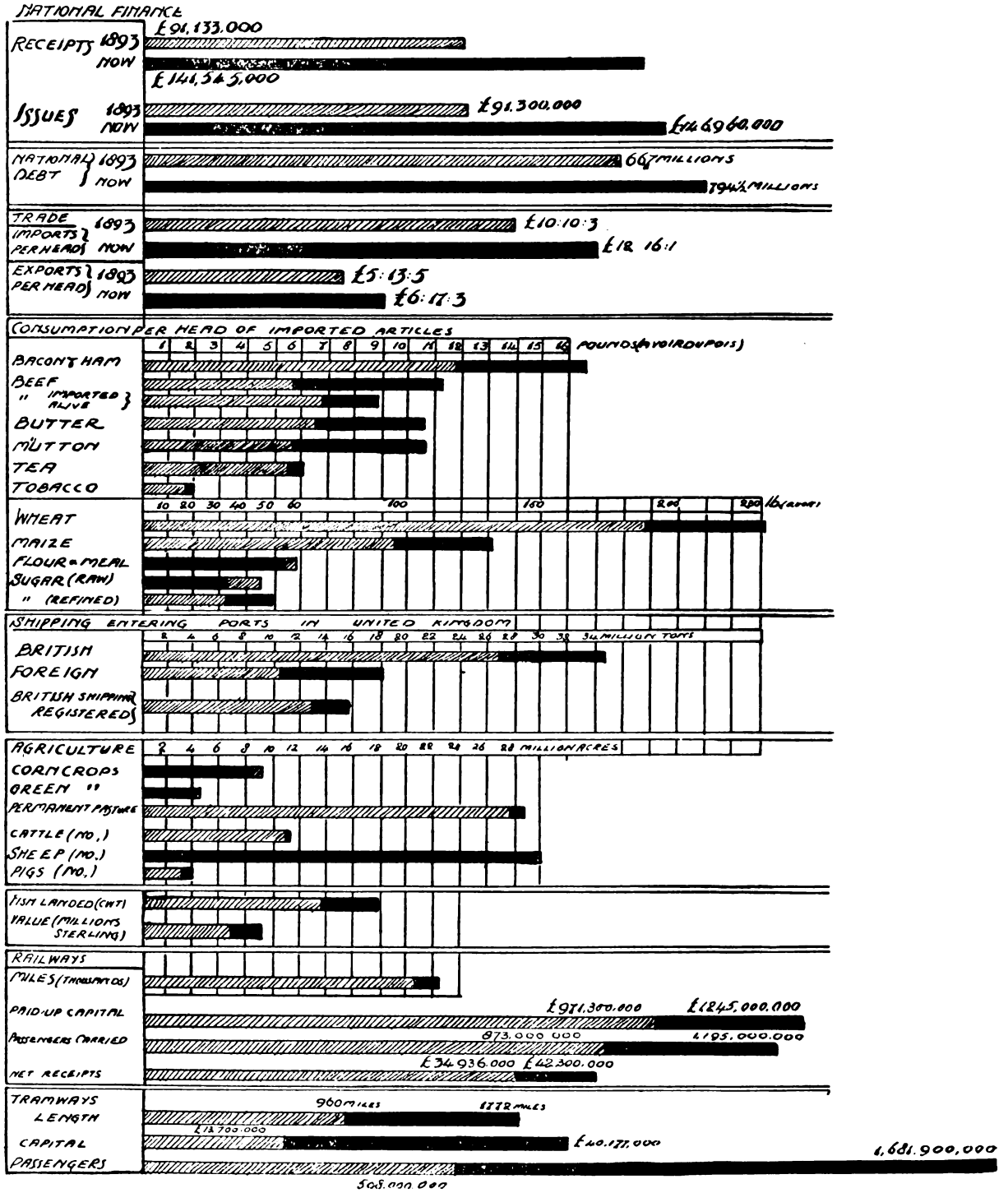

THE SOLID BLACK LINES SHOW THE INCREASE IN THE PAST TEN YEARS

between the figures given for 1893 and those furnished by the most up-to-date returns.

Unfortunately the official work contains no illustrations showing at a glance the great difference that exists between the figures of "then and now," and it is to remedy the only

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defect in an otherwise admirable compilation that the accompanying diagram has been prepared.

The premier comparison made is in respect to national receipts and expenditure in 1893 and the last financial year, the shaded columns being drawn in length in proportion to the figures current in 1893 and the black columns to those given in the latest available returns. A glance at the diagram shows that in ten years receipts showed an advance of 56 per cent., while expenditure increased by upwards of 60 per cent. Figures such as these will be regarded by the long-suffering and far-seeing taxpayer with anything but complacency, but he will derive some consolation from the fact that this remarkable rise in taxation and expenditure, owing to the war, was far from normal. As a matter of fact, during the decade prior to the last, receipts showed an increase of about 5½ per cent. and expenditure of about 6; it is to be hoped a return to this comparatively halcyon state of affairs will speedily follow.

The National Debt, owing to the same cause, it will be observed, has shown an advance from 667 millions to 794½ millions; but in view of the fact that in 1900 the Debt had been reduced to 628 millions, the apparent rise is less than the real. The figure at which the Debt now stands, by the way, is about on a par with that in the year of the Capitulation of Paris (1871), and is over one hundred millions less than its record for Waterloo year.

So far as the total foreign trade is concerned, ten years of commerce show an increase of 221 millions, of which increase by far the greatest proportion (138 millions) is due to imports, which show an increase of 34 per cent. as compared with an increase of 33.3 per cent. in the case of exports of home produce, which have increased by 72½ millions in the aggregate.

One of the most striking features of the comparison is afforded by an examination of the figures giving the consumption per head of imported articles. In our diagram, saving in the cases of flour and meal and raw sugar—articles that show a diminution—the whole column represents the consumption to-day and the shaded portion the consumption per head in 1893. Great as the increased consumption of foreign bacon and ham has been (namely, 40 per cent.) that of beef (100 per cent.) has been even greater. Butter also shows an individual increase of 60 per cent.—what are our dairy farmers doing?—eggs of 65 per cent., mutton of 85 per cent., tea of 12 per cent., and tobacco of about 20 per cent. Wheat and maize and refined sugar from abroad, it will be observed, are coming into this country in greater quantities than ever before, but flour and meal and raw sugar both show a falling off in our individual consumption.

With regard to our great carrying trade, the total amount of shipping entering British ports shows an increase of 41 per cent. in the ten years; of the actual increase, one half in tonnage is credited to British craft and the remainder to foreign vessels. It is noteworthy that whereas British shipping shows an increase of but 27 per cent., Foreign shipping visiting our ports has increased by 77 per cent. When will the authorities recognise that what is sauce for the goose is sauce for the gander, and insist upon foreign craft visiting British ports fulfilling the rules and regulations enforced upon the native merchant fleet?

Agriculture, we are continually being told, is going to the dogs in this country, therefore it will surprise no one to learn that the acreage devoted to corn crops and green crops has shown a slight falling off in each instance during the period under review. That the diminution in the cultivated area throughout the country is not overwhelming is, however, proved by the fact that in ten years it amounted to less than ½ per cent. The number of sheep (then 30 millions, now 29,658,863) has fallen off by about 1 per cent., but cattle have increased by about 1¾ per cent., and pigs by about 25 per cent.; that there is plenty of demand for a further supply of home-grown pigs is apparent from the import returns of bacon and hams.

Turning to the railway statistics, it is found that capital invested has increased by 28 per cent., passengers carried by 36 per cent., and net receipts by about 21 per cent., figures remarkable in themselves but insignificant when compared to the marvellous increase that has been manifest in the tramway world. Exigencies of space preclude any lengthy comment upon the extraordinary impetus that has been apparent in the tramways of this country of late, but it may be pointed out that the length of the same has increased by 84 per cent., that the capital invested has increased by 193 per cent. and the passengers carried by 180 per cent. The net receipts, it should be mentioned, show an increase of 235 per cent., a result that compares somewhat favourably, to say the least, with the railway showing.

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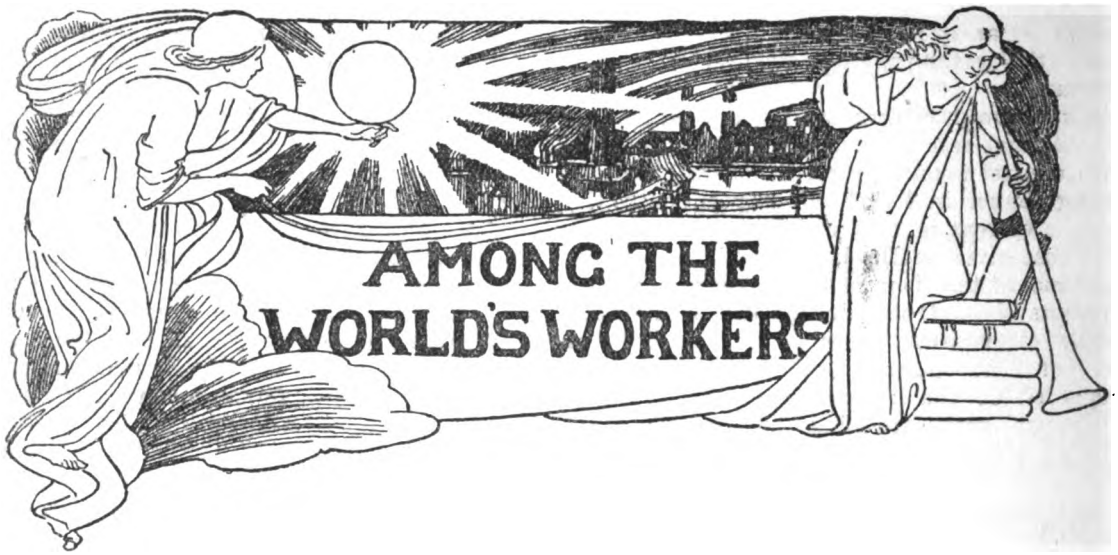

"BUILDING A COUNTRY HOUSE"—CORRECTIONS

OUR contributor "Home Counties" (whose valuable articles on cottage-building in THE WORLD'S WORK AND PLAY are being revised and amplified for early publication in book-form) writes as follows:

"In last month's article on bungalow building, Mr. Potter was quoted as suggesting the laying of linoleum on a concrete floor 'while wet.' This is a mistake. The linoleum must be laid down when the floor is perfectly dry. Then the Garden City people complain that they are not opposed to earth-closets—which are, of course, infinitely superior in the country to water-closets—but rather favour them. I notice, however, that they forbid their introduction on plots of 'less than a quarter of an acre.' As every person who understands the enlightened earth-closet system knows, it can be satisfactorily worked on a smaller area. But if the regulation should result in every house-builder on the Garden City estate attaching at least a quarter of an acre of ground to his house, I for one shall consider the rule an excellent one.—HOME COUNTIES."

TO UNEARTH AN ANCIENT CITY

PROFESSOR CHARLES WALDSTEIN, of Cambridge University, puts forward a scheme for the excavation of Herculaneum, the city which, together with Pompeii, succumbed to Vesuvius. The last excavations were undertaken in 1875. To continue work would require a sum of money which no single Government would care to appropriate. Professor Waldstein's plan is to have the United States and the principal countries of Europe co-operate in unearthing the ancient town. This may be a rather difficult engineering feat, as the modern city of Resina is built upon the ancient site and must be preserved as far as possible. Professor Waldstein has formulated a plan whereby the work is to be supervised by national committees in each country, the honorary head of each to be the ruler of the particular country. An international committee is to be headed by the King of Italy, and an international staff is to be appointed, with whom the Italian archæologists into whose hands the work will be entrusted are to consult.

Pompeii was but a provincial town inhabited by Romans of the lower class Herculaneum, on the other hand, was a city of villas, and its inhabitants were the *élite* of the empire. More Greek than Roman in its artistic atmosphere, the city retained its distinctive character up to the time of its destruction, and attracted many Greek artists and writers. The finds which were made a quarter of a century ago during the interrupted excavations gave promise of still more important discoveries. "In one house alone," said Professor Waldstein, "sixty-five copies of one work on Epicurean philosophy were discovered. . . . May we not find in Herculaneum the lost books of Livy, the great lost dramatist, and throw new light on the early history of Christianity?" Herculaneum was more fortunate, from the archæological standpoint, than Pompeii. Unlike the latter city, it was not covered with ashes which destroyed everything that was perishable, but was overwhelmed to a depth of eighty feet with a kind of soft mud which has acted as an excellent preservative of wood, papyri, statuary, and other objects. After the eruption of Vesuvius many Pompeians returned to their homes and hastily removed whatever valuables had escaped the eruption. The depth to which Herculaneum was buried prevented a similar procedure by its people. For that reason the excavation of Herculaneum means the revela-

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tion of a Roman city exactly as it was left in the highest state of its development. Dr. Waldstein is acting with the full knowledge and approval of the Italian Government.

A CATALYSIS PRIZE

CATALYSIS, or the influence exercised by certain substances on the chemical composition of other substances which do not of themselves enter into combination, is always a subject of interest to scientists. Professor Van't Hoff has instituted a prize of £60 for the best memoir on catalytical facts. The papers sent are to be judged by Messrs. Van't Hoff, Arrhenius, and Ostwald, and must be given in before June 30, 1905, to the *Zeitschrift für physikalis he Chemie*, 2, Linnestrasse, Leipzig.

PACKING FOR STEAM-BOILER MANHOLES

A SIMPLE method of packing manholes of steam boilers is submitted to the *Scientific American* by a correspondent. He states that it is not generally known among users of steam boilers that the best and cheapest packing for manhole or handhole is a piece of common lead pipe. For a manhole take three-eighths or half an inch, bend it around the plate, and cut the ends square and solder together, so as to leave no bunch. With a nail or other tool make two or three small holes on outside, to let out the air when the pipe compresses, and a packing is provided that can be used over and over again. A packing of this kind has been used for fifteen years, and it is found that one lasts from three to five years at an outlay of about 1*s.* 6*d.* or 1*s.* 9*d.* When used up they are worth half-price for old lead.

FREEDOM OF ENTERPRISE BETWEEN NATIONS

A FRENCH syndicate has designs upon part of the splendid crescent site between Aldwych and the Strand, which has been unoccupied since the demolitions carried out by the London County Council. The idea is to erect here a building which will comprise a French theatre, restaurant, and *café*, with galleries for industrial and art exhibitions. It is to be surrounded by gardens, with fountains and statues; while there will be shops on the street frontages all round. As these shops would naturally be occupied by French shopkeepers, the French character of the whole project would be very marked; and the value of the site as a business enterprise is apparent by the offer made to the County Council by the promoters of the scheme—namely, a ground rent of £55,000 a year for a ninety-nine years lease. The Council, it seems, will decline it.

At the same time the invasion of Paris by an American syndicate is reported, the object in this case being the purchase of the Palais Royal. The correspondent of *Commercial Intelligence* states that the purchase price will be about one and a quarter million sterling. It is said that the idea of the syndicate is to turn this building into an immense store where every kind of American-made goods may be inspected and purchased. Among those concerned in the affair are mentioned Mr. Adams, an American ironmaster, Mr. Silas Dutcher, a director of a powerful Brooklyn trust, Mr. Loomis, of the Lackawanna Railway, Mr. Walter Griffin, the commercial agent of the United States at Limoges, and two or three French and American financiers.

The United States Consul at Birmingham has lately been indulging in reflections very flattering to his countrymen upon the Americanisation of British manufactures. If a census could be taken of the Americans who are engaged in some capacity or other in British industry it would, he says, be a formidable presentation of American influence in British manufactures. No doubt; and we may add that their British employers know well what they are doing when they take what is good from other systems—American or Ge man—and graft it on to what is abidingly good in their own.

THE TAXIMETER FOR CABS

THE experiment of payment by distance has been tried by the Paris cab companies during the last five or six months, and is generally pronounced satisfactory. Only about one thousand cabs were supplied with the taximeter, so that at present the new system is not obligatory. The taximeter looks like an ordinary sized alarum clock, and it is fixed on the driver's seat, facing the occupant of the cab. A small flag is attached to the apparatus, and when this is in an upright position it signifies that the cab is empty. When the vehicle is engaged the driver at once lowers the flag, and this movement sets the taximeter in motion. The figures 75 at once appear on the face of the apparatus. This stands for sevenpence halfpenny, and entitles the occupant of the cab to a drive of about twelve hundred yards. For every additional four hundred yards one penny more is added.

When the cab stops for a time the driver changes the distance-meter for the hour-meter, and one penny for every three minutes is then charged.

Inside the taximeter is an apparatus which registers the total receipts of the day.

A new law has just come into force after the four or five months' experiment with this new system of cab payment. It appears that in spite of all the improvements introduced the mechanism of the taximeter has occasionally proved faulty, and discussions have been the result between the drivers and the occupants of the cabs. The company has now decided to take upon itself all losses due to the

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imperfect working of the taximeter, so that henceforth a cabman may only demand the amount registered, and if the apparatus should be at fault he must not accept another fare until the taximeter has been repaired.

SCIENTIFIC AGRICULTURE

THE recent discussions in the Austrian papers on the subject of indirect medication have been followed by various articles in the French papers. The agricultural-bacteriological station of Vienna is continuing its experiments with the cultivation of vegetables, increasing by artificial means the proportion of salts of iron contained in them.

The idea is by no means new, as in 1579 Dr. Miraud wrote a book showing that the therapeutical virtues of various vegetables might be increased if alimented with certain substances containing medicinal properties. In 1860 Dr. Champouillon communicated to the French Academy of Sciences the results of his experiments with the strawberry plant and the vine which had been watered with nitrate and carbonate of potash. Dr. Champouillon mentions two cases of dropsy which were cured by a diet of strawberries saturated with nitrate of potash and white wine mineralised.

In 1897 M. Emile Lévy tried the experiment of feeding fowl with corn and salts of iron. It appears that the eggs thus obtained contained a fair share of these salts in a form perfectly assimilabl .

Fertilisers of various kinds are now playing an important *rôle* in agriculture. Hitherto phosphates and other substances have been largely used, but the latest experiment has been to employ fish which is no longer comestible for this purpose. In America about 240,000 tons of *menhaden* is caught annually and about 99 per cent. of this is now dried and used for fertilising purposes.

Since it has been realised that fish can be used for fertilising purposes the refuse of the markets has been greatly in demand, so that this now creates a new industry.

A UNIQUE SWISS ENTERPRISE

AN enterprise which is soon to be commenced in Switzerland is certainly unique in Europe, if not in the world. An enormous reservoir is to be constructed by damming the River Sihl, in the canton of Schwytz. This artificial lake will then occupy a whole valley and contain ninety-six million cubic metres of water for the alimentation of a powerful hydro-electric installation destined chiefly for the electric traction on the railroad. The wall will be 78 ft. high, and about 300 ft. in length. A difference of level will thus be obtained between this basin and the Lake of Zurich, in which the water will flow by means of a tunnel with a fall of 480 metres, producing a force of 28,000 horse-power during twenty-four hours or 60,000 during eleven hours. A contract has been signed by the Government of Schwytz and that of Zurich and the work is to be commenced some time during the spring.

THE NEW TORTOSA OBSERVATORY

THE new Observatory of Physical Astronomy at Tortosa, in Catalonia, is one of the finest of the kind. The founder of this new establishment is the Père Cirera, who was formally Chief of the Magnetic Department of the Manilla Observatory. One of the chief objects of those in authority at the Tortosa Observatory is to discover the relations which may exist between magnetic, electric, and solar disturbances. These phenomena are to be registered at once and regularly so that they may be studied seriously.

The establishment consists of seven buildings. The dwelling-house and offices form one, then come two pavilions for magnetism, one of which is reserved for instruments of variation. The other pavilion is used for absolute determinations. Another of the buildings is for meteorology and electricity, and another for seismology. There is a pavilion entirely devoted to Physical Astronomy. All these various departments are well supplied with the most modern apparatus and inventions for the study of the various subjects, and all that is now desired is a monthly record of the work of this Observatory for the benefit of the world at large. It is hoped that funds for this publication will be provided by some one interested in Physical Astronomy.

TELEGRAPHY AND THE PRESS IN JAPAN

THE Berlin *Archiv für Post und Telegraphie* publishes an article showing the progress made by Japan since the year 1868.

It seems that in 1869, when the first telegraphic line was laid between Tokio and Yokohama, the Japanese Government had the greatest difficulty to protect this line from being destroyed by the superstitious population. Ten years later it was impossible to supply promptly enough all the demands for new lines, and in 1881 the municipalities offered spontaneously to meet the expenses. By the end of 1901 Japan possessed 1856 telegraph offices and three submarine cables.

Since the year 1887 Japan has also had a telephonic service, and by the end of 1901 25,000 subscribers and 25,000 more demands for connection with the existing lines. The Japanese have kept up with the times, as their telegraphic and telephonic systems are quite up to date, and they have also made some successful experiments with wireless telegraphy. At present the apparatus, wire, isolators, &c., are all manufactured by

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Japanese workmen. During the year 1871, 19,000 telegrams were transmitted and in 1901 16,221,000.

As regards the Press, within the last seven or eight years there has been the most remarkable development, both as regards newspapers and books. There are at present 480 daily papers in Japan. The *Taiyo* is a monthly illustrated with a circulation of 100,000. The *Tokyo Kreiryai Zasshi* is the oldest of the weekly papers. It is edited by the proprietor, M. Taguchi, one of the most eminent politicians and the first economist of Japan. He is a partisan of free trade. There are two English papers, the *Japan Mail* and *Japan Times*, published there, too, with daily and weekly editions. The newspapers are sold in the streets by men who carry with them a bell to attract attention.

THE NEW OCEAN MAP

IN May the famous Ocean Map consisting of an album of twenty-four pages is to be published.

Oceanography made great strides during the second half of last century. For submarine telegraphy and for the fisheries a more exact knowledge of oceanography was absolutely necessary, and in order to arrive at this it is indispensable that the people of all nations should work together.

Hitherto there have only been two general bathymetrical maps, that of Sir John Murray, executed from the reports of the *Challenger* expedition, and that of the German navy. Both of these maps are of a certain value, but they are both carried out on so small a scale that there is not enough room for details.

At the International Congress held at Berlin in 1899 it was decided to construct a map of the oceans, and in order to do away with the confusion caused by the various terms used for submarine topography in the various countries it was decided that there should be an equivalence of terminology in the various languages.

In the year 1903 the Commission met at Wiesbaden, with the Prince of Monaco as President, and it was then decided how the work of the new Ocean Map should be carried on. Six chartographers at once set to work, and at the International Congress of Geography, held at Washington on September 13, 1904, the first instalment was examined, and the Congress congratulated the Prince of Monaco on the work done.

The map or chart has been continued at Monaco under the supervision of M. Charles Sauerwein, a midshipman, and the calculations are due to Professor Thoulet.

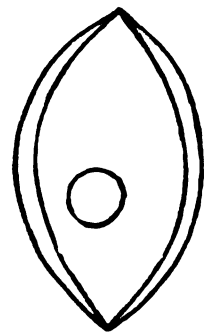
THE SEVERN DISTRICT CANAL TRUST

A SCHEME for the formation of a trust to control the waterways in the Severn Valley district has been drawn up by a committee of the Worcester Chamber of Commerce, and was considered by the Chamber at a recent meeting. The trust would be managed by representatives of present proprietors and of county councils and borough councils within the district; but it was pointed out that there was no implied antagonism to the nationalisation or unification of canals generally. The matter was local to this extent, that if Liverpool were so interested as to develop the Weaver to get the trade of the Midlands, Bristol should be equally interested in the waterways concerned in the scheme which embraces the Severn Navigation and Lower Severn, the Upper and Lower Avon, and the following canals: Shropshire, Gloucester and Berkeley, Stroud Water, Thames and Severn, Wilts and Berks, Somersetshire Coal, Worcester and Birmingham, Droitwich, Worcestershire and Staffordshire, Stourbridge-Birmingham Canal Navigation, and Stratford-on-Avon. A meeting of the local authorities and others interested is to be held to consider how to give effect to the scheme.

THE MAKING OF AN INDIA-RUBBER BALL

THE making of an india-rubber tennis ball would appear to offer some scope for the inventor, particularly with regard to its rate of production. The following description might suggest at what point (or points) of the process the utilisation of machinery would benefit alike the maker and buyer, by decreasing the cost.

The process begins by marking out on sheet india-rubber, about $\frac{1}{8}$ in. thick, four figures of the following shape. The sheet is then passed on, wetted and cut out (with bevelled edges) by a sharp knife. The pieces are passed on to the next operator (the whole process is carried out by girls), whose duty is to cover the bevelled edges with an adhesive solution. One of the pieces has a small disc (about $\frac{3}{4}$ in. diameter) of the purest india-rubber stuck on it, and then it and the other three are stuck together. Preparatory to their being finally sealed up, a definite quantity of ammonium chloride is placed in each ball.



The balls, which are now in a "flabby" condition, are vulcanised by placing them in a steam-heated oven in an apparatus (Figure A). In this process the ammonium chloride volatilises and blows the ball out to the size of the receptacle B, in which condition the action of the heat combined with the sulphur already in the india-rubber, causes the ball to receive the hardness and durability which characterises it. When taken from the oven, the ball becomes "flabby"

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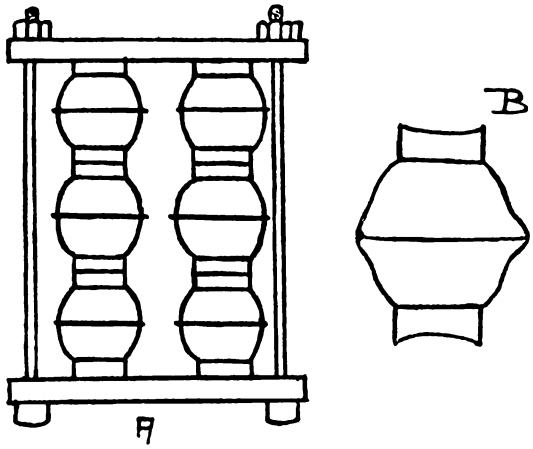

again, since the ammonium chloride returns to its solid state.

The vulcanisation takes from half an hour to one hour but must not be prolonged beyond that time or the small disc of pure rubber will also become vulcanised and, as will be seen later, this would render the finish of the ball impossible. The ball has now to be filled with air. This is done by first feeling for the disc of india-rubber and then pressing into it a sharp hollow pin which, when pressed back, allows air at a pressure of fifty pounds to pass in. This distends the ball until it will just pass through a brass plate, the centre of which is cut out to the regulation size. Then the needle is withdrawn and the hole (which only shows in the outer covering, as the pure india-rubber disc inside closes up just as if it had not been pierced) is stopped by a piece of soft rubber. The ball is then finished by grinding the uneven parts against a sand-paper wheel.

From first to last—excluding the vulcanisation—one ball takes about five minutes to make, but in this age of inventions and quick-production machinery, it seems as if some quicker method ought to be possible.

HOW WEATHER PREDICTIONS ARE MADE IN AMERICA

NOT the least valuable assistance the United States Government renders mariners and farmers is furnished in its weather forecasts, four-fifths of which turn out to be correct. Indeed, the record of the weather bureau for the past five years has been that no serious storm has occurred that has not been predicted sufficiently long in advance for all people whose interests are affected by the weather to take due precautions. Daily at eight o'clock in the morning and at eight o'clock in the evening by Eastern time, observers at more than two hundred stations in the United States, Northern Mexico, Southern Canada, and the West Indies telegraph to map-making stations observations on every detail of the weather, such as temperature, humidity, the kind and the direction of clouds and so on. At each of these stations, charts, made from the information in the reports, are prepared for free distribution over the adjoining district. In many places in the West the weather forecast is telephoned from central telephone stations to all the farmers in the neighbourhood.

The approximate accuracy of the forecasts results from the fact that the Government observers know how the weather conditions move. Seven-tenths of America's storms, for example, begin in the north-west, move south-east and then curve north again over the Great Lakes and disappear to the east down the St. Lawrence Valley, though the West India hurricanes move first west and then north-east. The storms are located by low barometric readings and by the direction of the winds—which whirl about a storm-centre in the opposite direction to that of moving clock hands, sometimes spinning around a circle a thousand miles in diameter. To the east of the storm blow southerly moist winds which bring rain. To the west of the storm come winds from west or north-west bringing colder weather. So by experience the weather observers, receiving reports of the conditions at storm-centres, can predict from the rapidity of the movement from west to east how far a storm will advance in twelve or twenty-four hours, and what kind of weather will result in every quarter of it. Predictions can thus be made two or three days in advance. And now the Government is building on Mount Weather, Va., an observatory for weather research. Efforts will be made there to establish forecasts of whole seasons.

A WOMAN'S IMPORTANT POST

THE new post of Chief Woman Inspector under the Board of Education is already distinguished by having as its first holder Miss Maude Lawrence, a daughter of the late Lord Lawrence. This lady was a member of the London School Board from 1899 to 1904, and has been on the Executive Committee of the London County Council since 1904. Answering a *Daily Chronicle* interviewer, who asked about the work she hoped to do in her new office, Miss Lawrence said: "It has only been created; and I feel that the first need is to find out what is actually being done at the present time, particularly by the women inspectors, of whom there are five. Doubtless, more will be appointed soon. I take a great interest in the question of secondary schools, but most of my experience has been in connection with elementary schools. I began as a manager of a Chelsea school, and then for nine years I acted as chairman of the managers. In 1898 I was co-opted on to the School Board,

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and in the following year I was elected for Westminster. It is rather interesting that my father should have been chairman of the first London School Board, and I should have served on the last. Under the School Board I was chairman of the Special Schools Committee, and that is a branch of the work that I am really very sorry to be obliged to resign. It was during my chairmanship that all the inquiries were made which led to the establishment of the special schools for defective children, of which there are now eighteen. I have done a good deal, too, towards the establishment of the residential school at Anerley for older deaf boys, and towards starting an After-Care Committee to get them employment when they leave. After-care committees are much needed in these special schools; those for the mentally defective present the greatest problem. I hope a residential school for elder deaf girls will soon be started. We seldom meet with any opposition from the parents, who pay towards the cost in proportion to their means."

INDIA-RUBBER FROM THE FRENCH CONGO

IN the paper *L'Agriculture pratique des pays chauds*, M. Gaynet publishes an article on the india-rubber obtained from plants in the French Congo. M. Chevalier, the well-known French explorer, says that this india-rubber is obtained from herbaceous plants of the *Landolphia* species. There are two kinds, the *Landolphia Tholloni*, and the *Landolphia hurmillis*. These small-leaved plants are usually rather more than a foot high and the india-rubber is obtained from the parts of the plant underground, which form a net-work of rhizoma, varying from the thickness of a pencil to about the thickness of the arm. The india-rubber is enclosed in the inner cortical part of the plant and forms a network of elastic threads contained in laticiferous ducts. It is impossible to extract the india-rubber in the same way as from the trees in Brazil or the bind-weed in Africa—that is, either by bleeding or cutting in fragments—as the latex of the rhizoma of the *Landolphia* is too thick.

By the process which has been patented by MM. Arnaud and Verneuil, the whole of the india-rubber can be extracted. It consists in the contusion of the cortical parts of the rhizoma by percussion in a somewhat complicated apparatus, so that the india-rubber is extracted in its natural state. The boiling water used for the African india-rubber takes away much of the gummy substance, and the quality is therefore impaired.

This French Congo india-rubber is very elastic, and is for various reasons very much in demand by manufacturers, particularly on account of the facility with which sulphur can be incorporated with it without changing its nature. The rhizoma of the *Landolphia Tholloni* contain 6 to 8 per cent. of india-rubber, according to the age of the plant and the season when it is gathered. As there is an inexhaustible quantity of these plants from which this india-rubber is obtained, it will no doubt prove to be a great source of wealth for those who exploit it.

The Batéké plateau is rich in the Landolphia species, and Dr. Spire has gathered it throughout the Congo as far as the Blue River. M. Gaynet found it too in the Upper Ogowé. M. Fondère states that he found it in Upper Sangha, and M. Chevalier on the Ubanghi, and in the Chari. The fact that it is to be found in so many different localities is considered a good omen for its future cultivation.

THE SAVOY WATCHMAKING SCHOOL

THE crisis in the clock and watch industry of Savoy has drawn attention recently to the famous School of Watchmaking of Cluses. This industry was established about the year 1715. The Piedmontese government founded the School of Watchmaking in 1848, and M. Benoit was the Director for about forty years. In 1863 there were 2400 watchmakers, and the business done amounted to about £90,000. One of the most interesting parts of the trade is the making of the pinions. Six of these pinions are required to make a set, and four million sets are exported annually to Switzerland; two millions to France, and half a million to other countries. The instruction at the School of Watchmaking extends over a period of three years, and is both theoretical and practical. The new building which was inaugurated in 1886 is large enough for two hundred pupils. The State grants an annual subsidy of £2400, and the department adds to this £80.

OUR ABUNDANT COAL RESOURCES

THE report of the Royal Commission on Coal Supplies will be a pleasant reassurance to those who are affected by fears as to the early exhaustion of coal in the United Kingdom. It proves that there are supplies for three hundred years and more. The Royal Commissioners adopted 4000 ft. as the limit of practicable depth in working, and 1 ft. as the minimum workable thickness, and after making the necessary deductions, they estimate the available quantity of coal in the proved coalfields of the United Kingdom to be 100,914,668,167 tons. In addition to the coal within 4000 ft. of the surface, there are in the proved coalfields considerable quantities lying at greater depths; whether that coal or any of it is recoverable or not depends upon the maximum depth at which it may be found possible to carry on mining operations. The estimated quantities of such coal amounts to a total of 5,239,433,980 tons.

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The Geological Committee appointed to inquire into the productive measures known or believed to exist outside the areas dealt with by the district commissioners, report that the amount of coal which may be expected to be available in the concealed and unproved coalfields at depths less than 4000 ft. is 39,483 millions of tons. This total does not include certain areas where the data are insufficient for an estimate. Under the head of unproved coalfields come also the undersea areas lying between five and twelve miles beyond high-water mark in the Cumberland coalfield, estimated by Sir Lindsay Wood to contain 854 million tons, and undersea areas in St. Brides and Carmarthen Bays, estimated by Sir William T. Lewis to contain 383 million tons.

The Commissioners believe there is yet no substitute for coal, though other sources of power may slightly relieve the demand for coal. They also condemn the export duty. "Although the figures do not conclusively prove it, we cannot doubt," they say, "that an export duty must restrict the tonnage exported, and that the burden of the tax presses relatively more heavily on the coal, which in value is slightly over the margin of price at which coal is exported free of duty."

TRADE OPENINGS IN CANADA

THE following were among the inquiries relating to Canadian trade received at the Canadian Government Office, 17 Victoria Street, London, during the week ending February 17, 1905.

A London firm desire to get into touch with a reliable house in Canada handling sugar and other commodities used by confectioners, biscuit bakers, &c., with a view to taking up the agency for desiccated cocoa-nut.

A firm of art metal workers and craftsmen in all metals for ecclesiastical and domestic use desire to extend their business connection with Canada, and ask to be referred to interested parties.

A firm who are likely to be large buyers of butter, cheese, and eggs for the London market are anxious to get into communication with exporters in Canada.

A correspondent interested in various patents of use to tube manufacturers has asked to be placed in communication with Canadian firms in the business.

An engineering firm desire to extend their Canadian business in forced draught furnaces for steam boilers, and refuse destructors.

A manufacturers' agent in Montreal is seeking the representation in Canada of a high-class hosiery firm or a Belfast linen and canvas house.

Inquiry is made by a Canadian firm of agents for names of English houses who supply cast-iron water- and gas-pipe, fire-clay goods such as sewer pipe and fittings, fire bricks, &c., gas-engines, cast-iron valves for water and gas, and water works supplies generally.

Inquiry has been made from Montreal for an English lace manufacturer or corset and fancy article exporter desiring representation in Canada.

A Toronto firm desires to get into touch with English houses publishing greeting cards, post-card albums and post-card revolving stands, with a view to representing them on the Canadian market.

THE LARGEST DIAMOND IN THE WORLD

IT is reported from Johannesburg that the largest diamond ever found has been taken out of the Premier mine. It weighs 3032 carats in the rough. A few years ago a large black diamond was found in Brazil, which was somewhat larger, but this gem was of no ornamental use, and was eventually cut up and used in making diamond drills. Except for it, the gem just found is three times larger than any hitherto discovered. The stone weighs about a pound and a half. In cutting it from 40 per cent. to 60 per cent. will be lost. The stone's value will depend, of course, upon its quality and shape. Approximately, the new stone weighs about 621.56 grammes, or about a pound and a half avoirdupois. The last diamond of any note found in recent years was the "Syndicate," dug up in the De Beers mines, which weighed, uncut, 960 carats.

TALENT *VERSUS* FAVOURITISM

THE debt that a youthful ambition owes to competition is demonstrated, says a writer in the February *Cornhill Magazine*, by the fact that, among joint-stock companies, those which are least liable to immediate and obvious competition are those among which nepotism and favouritism are still most rife. Our railway companies, for example, are, as far as inland business is concerned, virtually in the position of monopolists. Lulled by the feeling of being masters of the situation at home, they overlook the fact that they are really face to face with competition on the part of railways all over the world—if railway rates give the American iron-founder, farmer, or cotton-spinner an advantage over his English rival, English trade will *pro tanto* suffer, and this suffering will inevitably react upon the railway companies. On the other hand, in businesses like banking and insurance, in which the competition stimulated by the joint-stock system is allowed free play, we find that the advantages secured by connection and favouritism have, as a general rule, least weight; and that the lad of talent and energy, who has only his talent and energy to rely on, has here the best chance of making his way.

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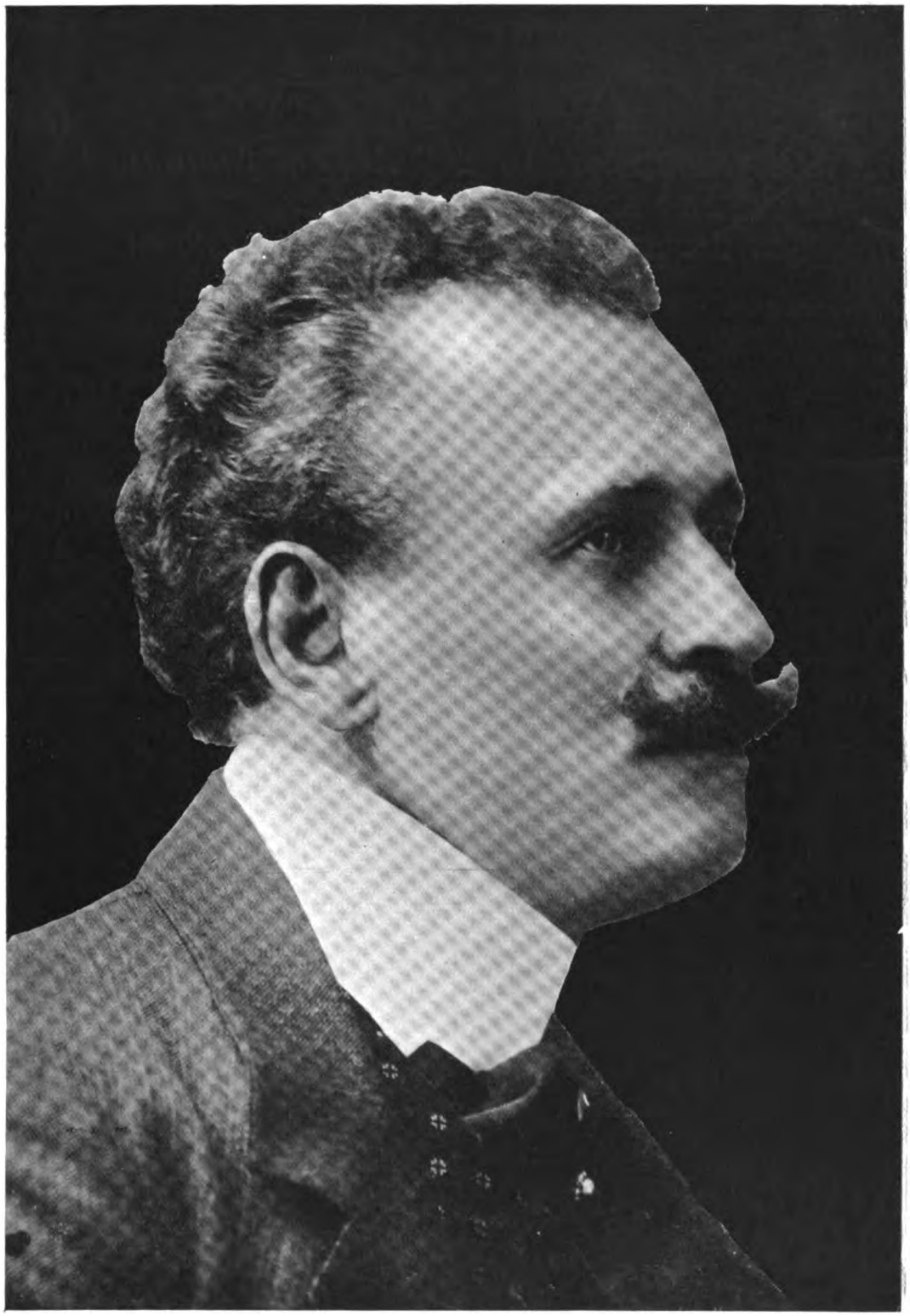

EUGEN SANDOW

AN ACCOUNT OF WHOSE WORLD-WIDE WORK OF HEALING ILLNESS APPEARS ON THE FOLLOWING PAGES

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EUGEN SANDOW

AN ILLUSTRATED CHARACTER-SKETCH SHOWING HOW HE HAS COME TO BE PROBABLY THE GREATEST HEALER OF ILLNESS THE WORLD HAS EVER KNOWN

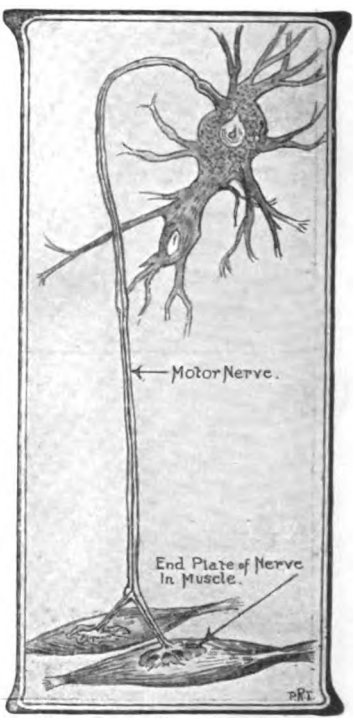
IN the great drama of life, unfolded before our eyes day by day, there is much that causes us astonishment, much that makes us pause and think. It is always the unexpected that happens. The saying is commonplace, but to him who has eyes to look into the inner meaning of things, the proverb is full of concentrated wisdom. The world rolls on its weary way, and multiplying cynics with self-complacency affirm that there is no new thing under the sun. But let us thank the Fates, who so often controvert such pessimism. This old world of ours is full of new surprises, and the last state of humanity is better than the first. Take the world of work and of play. Each is a sphere within itself. Each may be said to be a law unto itself. Approximately, a worker is a worker, and a player is a player, until the allotted course is run. Rarely do we find the twain consolidated in genius, such a result would be to us in the nature of a paradox. Yet the unexpected does happen, and Nature does not always prohibit paradoxes. An eloquent illustration of this truth is furnished by the life of that eminent celebrity, Eugen Sandow.

EUGEN SANDOW

The discovery of Sandow was by the merest accident. Mr. Aubrey Hunt, the artist, whilst painting in Venice one day in the year 1889, met a particularly fine-looking, muscular young man, and, in the course of conversation, suggested that he might do worse than go to London and try conclusions with a famous strong man who was issuing a challenge to the world to rival his feats of strength. The young man was Sandow, who, inspired by the artist's praise, determined to act upon his suggestion.

How he came to London, saw, and conquered, how he added record to record, going on from strength to strength, are all matters of history and need not be recapitulated. He might well have rested upon his laurels here, but no, somewhere at the back of his mind, there was a clear perception of the need of humanity, and the plan of its fulfilment.

And so we pursue his psychological development. Sandow has always been a thinker, and one who has ever sought to translate thought into action. As a child he had been puny and delicate, but through a well-conceived system of training and exercise he had been able to overcome all obstacles to strength. What had proved such a source of success in his own case, would benefit others also. And now we see the player dropping into the background, and the worker taking his place. Individuals, schools, clubs, nations, all have followed his teaching with lasting benefit to themselves. All over the world people continually breathe his name with deep affection, for they have discovered that strength and symmetry of form are not the chance, prodigal



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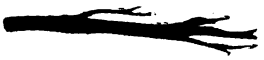
endowment of nature, so much as the result of a well-thought-out system of exercise and training, within the reach of all who follow his guidance. But his work is not yet completed. Working and thinking, thinking and working, he must needs fulfil his mission in life. And so the development of his purpose proceeds. He is always studying the human body, scientifically and physiologically, noting the effect of certain movements upon it, classifying and modifying them until they act with infallible certainty. For more than a decade he has been respected as the scientific builder of the human body. But now he has inaugurated the attainment of the greatest of his life's works—the treatment and cure of several of the world's worst scourges.



THIS MUCH BLOOD

THIS MUCH OF HIM IS BONE

There is nothing savouring of quackery about the Sandow treatment. The medical faculty is not slow to expose nostrums and fallacies. Therefore, when they speak loud in the praise of Sandow's cure for such complaints as Indigestion, Constipation, Insomnia, Loss of vigour, and Nervous and Functional disorders, it may be accepted that the cure has passed from the stage of criticism and analysis, into the sphere of usefulness as a tried and demonstrated specific.

TAKING THIS TO BE AN AVERAGE SIZE MAN

The Sandow curative system of physical culture must not be reckoned as a "cure-all." There is no such thing as a cure-all, and certainly Sandow does not claim to perform the impossible. Only in certain definite diseases is the system beneficial. Those cases in which it is deemed inadvisable to recommend the Sandow system are referred to medical men, and in the same way the medical profession send to Mr. Sandow those cases which it is realised can only be successfully treated by him.

THIS MUCH NERVE

It is impossible here to give the full details of the Sandow curative system, but suffice it to say that this system is the perfected result of years of careful study and practical experience. Sandow has given his life to this one object—the alleviation of the sufferings of mankind—and from the practical experiences of the last few years it cannot be doubted that his efforts have not been in vain. To-day thousands owe lives of happiness and content to him, and in this very fact lies his reward.

There exist in some quarters erroneous ideas as to Sandow's system. To dispel these, let it be said, the system is not one entailing heavy-weight lifting nor violent physical exertion; neither does it demand from the patient the sacrifice of a great portion of time. What the Sandow system is may briefly be explained as follows: A gentle series of physical exercises, undertaken for a few moments at certain periods of the day. The exercises are, of course, specifically directed to reach the affected organs, not only relieving the same of their distress, but giving permanent strength in order to prevent a recurrence of the trouble. Even from what has been said, it must at once be seen that for indigestion, constipation, and such troubles there can be no better cure than the Sandow system, and in a like manner insomnia, loss of vigour, nervous and functional disorders rapidly disappear when treated by Sandow. No case is undertaken in which a cure is not confidently expected. The particulars of each case are carefully examined, and, unless benefit is practically certain to result, no treatment is offered.

THIS MUCH OF HIM IS MUSCLE

Mr. Sandow has quite recently placed his Curative Physical Culture system within the reach of all. It is not necessary now to pay even a first visit, the whole cure being effected in the privacy of the

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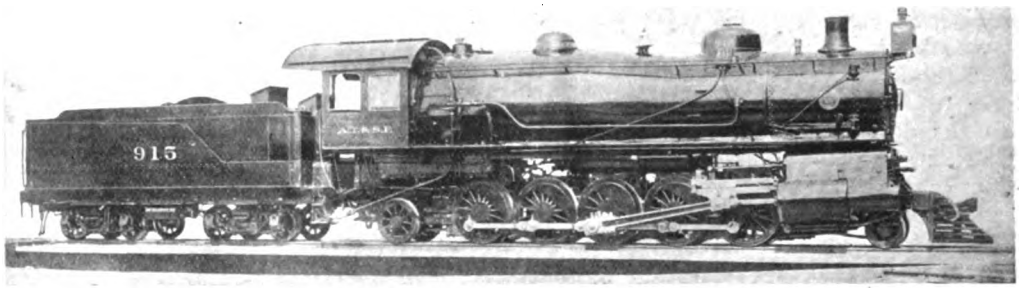


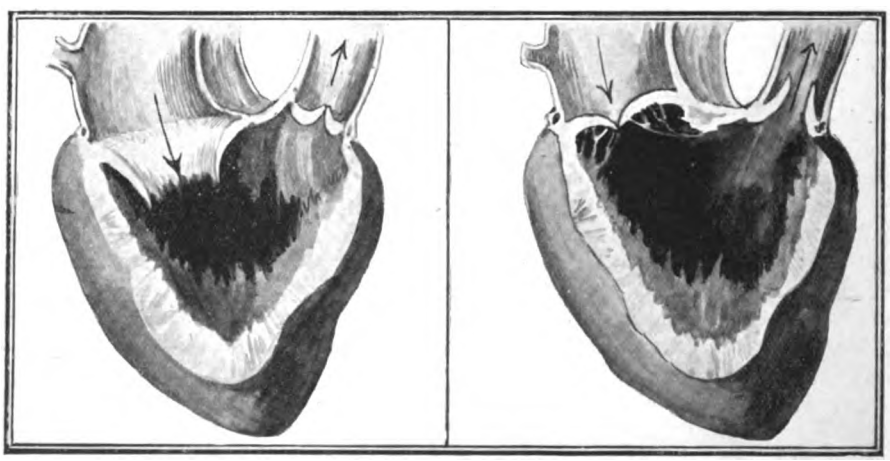
THE LARGEST LOCOMOTIVE ENGINE IN THE WORLD

patient's own home. Cases are treated by correspondence, and the organisation of the "machinery of the establishment," is as scientifically perfect as the remedial treatment itself. As long as full particulars are sent, advice can be given by post, and it is fairly safe to say that a fortnight under Sandow's treatment nearly always brings relief, and a permanent cure is usually effected in a month even in most obstinate cases.

In order to treat confidentially with the ailments of women, Mr. Sandow has a special staff of lady clerks, who deal with all the correspondence in connection with such matters. It may be stated here that the Sandow system has proved most efficacious in treating the ailments common to women and children.

All sufferers, never mind how obstinate and irremediable their case may have proved in the past, are strongly urged to write to Mr. Eugen Sandow for his illustrated book entitled "Curative Physical Culture," which he sends gratis and post-free to all. It is best to state the nature of the trouble in the letter, as it is often possible for Mr. Sandow to send some special information relative to the particular ailment, as well as his book.

"Curative Physical Culture" may be obtained by writing to Dept. D.C. 17 Basinghall Street, London, E.C., from which address the correspondence courses are sent out. Every writer may rest assured that his case will be carefully and individually considered and advised upon. Individual study of each case's requirements is a keynote to the success of the Sandow system.



THE SMALLEST ENGINE, THE HUMAN HEART. THE SKETCHES SHOW THE VALVES WHICH ALLOW BLOOD TO ENTER AND LEAVE THE HEART

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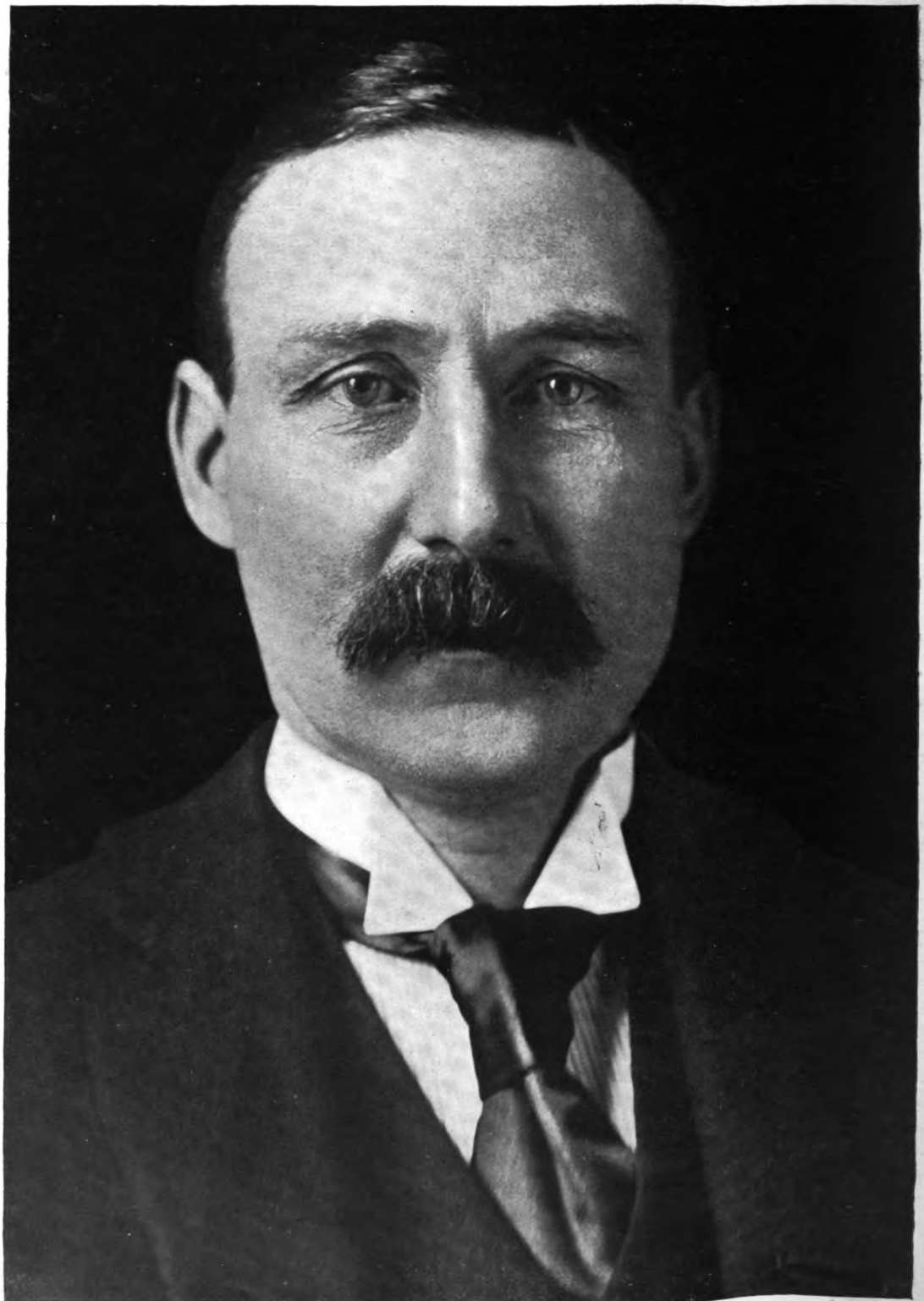

R. Haines

THE RIGHT HON. THE EARL OF SELBORNE, J.P.

WHO SUCCEEDS VISCOUNT MILNER AS HIGH COMMISSIONER FOR SOUTH AFRICA

A new photograph, now published for the first time

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The World's Work And Play

EDITED BY HENRY NORMAN, M.P.

VOL. V LONDON, APRIL 1905 No. 29

PROGRESS ON THE PANAMA CANAL

WHAT IS BEING DONE WITH THE MACHINERY LEFT BY THE FRENCH CONTRACTORS—THE HUGE ENGINEERING TASKS ON WHICH AMERICANS ARE WORKING—WHAT THE CANAL WILL BE AND HOW IT WILL PRODUCE TWO AMERICAN CITIES ON THE ISTHMUS

BY

LINDON BATES, JR.

WHEN the treaty with the Republic of Panama had been ratified by the American Senate, when a Canal Commission had been appointed, and when the French plans and surveys had been acquired, the way seemed clear for carrying through the Canal project. The Commission received almost supreme authority over the Zone. The French machinery and the work already accomplished were placed under their charge, and they were directed to construct the Canal in the best manner and in the quickest possible time. But, when the Commission arrived on the spot, they found the political situation ticklish and the engineering problem involved.

Of the things acquired from the French company, first in importance comes the Panama Railroad, a single-track, five-foot gauge road, parallel, in general, to the line of the canal and running from Colon to Panama. It is 192 miles long, with 46 miles of main line and 146 miles of sidings and of spur lines to the excavations. The Panama Railroad Company, which owns the railroad, also owns the line of steamers from New York to Colon. Six members of the Isthmian Canal Commission have now been made directors of the company, and the United States Government owns all the stock except a little over 1½ per cent., which has been retained by private individuals who have directed the policy of the railroad for many years, and still maintain a majority of the board of directors. This state of affairs is now the subject of Congressional inquiry.

The line holds a legal monopoly of the steam right of way, and no other means of communication, not even a waggon road, now exists across the Isthmus. Four dollars (gold), the fare prevailing until lately for first-class passage over the forty-six miles from Colon to Panama is an improvement on the twenty-five dollars fare which formerly prevailed, but it was much above the average rate in Mexico and South America. Both freight and passenger rates, however, have recently been reduced one-half.

The excavation accomplished by the French is another detail. As neither the old sea-level project, however, nor the 65-ft. level proposed, nor the 85-ft. plan of the former Commission, whose estimate was the basis for the purchase, is likely to be adopted, the amount of useful excavation is still doubtful. The former Commission estimated it at 39,586,000 cubic yards, but it may be less. The excavation at Culebra and at Emperador,

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and part of the sea level out as far as Bohio and on the Pacific end, will be of assistance.

The great mass of machinery left strewn across the Isthmus is another asset. To an observer paddling on the Chagres River or wandering through the tangle of vines and thickets on the Culebra Divide, there seems to be enough machinery to construct two or three canals and, in addition, stock a city of junk dealers. All along the Atlantic section of the canal the banks are heaped with structural material, parts of great caissons intended for the Bohio Dam, sections of the ship lifts that the gifted but venal Eiffel proposed to instal in place of locks, and miles of pipe and rails. Through the sixteen-year-old jungle on either side of the cuttings there are hundreds of dump-cars, intergrown with tropical vegetation. In unforeseen places one comes upon rows of sheds housing reserve rails, pipes, cranes, engines, and cars. In one spot the Chagres has eroded the bank and exposed a buried locomotive. Dredges, with unworn cogs revealing that they have scarcely been used, lie in many places along the river and the partly dug canal. At the summit of the Emperador, 280 ft. above tidewater, are the sections of a dredge ready to be put together. Along the whole line melancholy spectacles stand forth, monuments of frantic energy, mismanagement, and corruption.

The utility of this machinery must rest with the contractors or the Government engineers, who may employ what is fit. It is said upon good engineering authority that 70 per cent. of the material can be used. Many of the small Belgian locomotives are being put into service. Several of the French excavators are now at work. But the dredges and other floating machinery, a very costly part of the "material," is in bad condition and out of date. Salt or brackish water has so injured the hulls of even the few dredges and cranes whose machinery might be used that new hulls are imperative if they are ever to be employed.

The labour problem is serious. The French got their workmen principally from Jamaica, and when the company went into bankruptcy it left thousands of them stranded on the Isthmus. Colon is almost a Jamaican town, and a language called "English" is the ruling tongue. The inhabitants, too poor to leave, live along in hope of making a lucky strike in the Panama lottery, which will enable them to go back to what they pathetically call "home." It is sixteen years since there has been any activity on the canal, and during this time the imported blacks have got out of the habit of working. At Culebra, where some are now employed, they at first utterly refused to return to work after a rain, and American foremen are now struggling to root out this custom. At half-past ten one fine morning we saw all the "boys" sitting in front of their cabins placidly puffing at their pipes. They had stopped for the rest of the day because of a half-hour's shower. In a country where, during the wet season, an umbrella is a regular part of a man's raiment this habit is maddening. Where the labour

A SECTION OF THE PARTLY DUG CANAL

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A STEAM SHOVEL CAPABLE OF REMOVING 1000 CUBIC YARDS PER HOUR

for the new canal is to come from is thus an important question. The Philippines, Porto Rico, Central America, China, and the Southern States have all been suggested as sources of raw recruits, and none of them is satisfactory. The authorities will undoubtedly minimise the number of unskilled labourers, and substitute machinery as far as possible.

When the new Commission arrived, then, they found much débris, a railroad still dominated by the officers holding over since the failure of the French Company, the laziest negroes that ever mishandled shovels, and a new republic hailing them as heralds of golden harvests. Being technical experts, they began at once to examine the data of the French plans. They found these incomplete, with many vital details missing. The possibility of successfully piercing the ring of mountains that surrounds the valley of the upper Chagres, and so diverting the dangerous river beyond the canal zone, was undetermined. The engineers could not even make the final choice between a sea level and a lock canal, and it has been only recently that enough exact information has been gathered to allow this first question to be considered.

One step toward the completion of the canal was made, however, when new borings and surveys proved that the Culebra Divide could be pierced. It is true that this divide checked the French Company and that the sliding clays were difficult to handle. But it is not true that masonry slopes above water will be necessary to keep the hill from sliding down upon the boats in the canal. The excavation of the Culebra Cut is far less of a problem than many of the others involving the location of dams and spillways and the disposition of vast volumes of excavated matter. Digging the Culebra Cut is merely a matter of going ahead scientifically with the best modern machinery.

Since the Culebra Gap is the lowest available spot for the canal to cross the central ridge, there can be no other place for the cut. The Commission have, therefore, begun work on a small scale there by the recent purchase of fourteen modern steam shovels, of which the daily capacity is 25,000 cubic yards for twenty-four hours. With this machinery, in addition to that now available, the Culebra Cut can now be advanced.

The real difficulty lies in two great engineer-

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ing problems. One is that of regulating or excluding the Chagres River; the other is the Main Dam. The Chagres River is a fair-sized stream, subject, in certain seasons, to torrential floods. A dam at Bohio, located where the Chagres River breaks through the Atlantic coast ridge, would establish the summit level of the canal and carry it across the backbone of the Isthmus at Culebra. Consider the relations of these to the long-cherished sea-level project. The Chagres, until the Commission could find some way of diverting the waters for the Commission's decisions. And even so mighty a feat as the diversion of the Upper Chagres from the Atlantic to the Pacific may be undertaken. The French engineers considered that it could be accomplished only by a ten-mile tunnel piercing the backbone of the Main Divide. If this project be adopted, a dam will be necessary, and a lowering of the canal level to approximate sea level will result.

The main dam is the other great problem. If it is located at Bohio so that the summit level will stand ninety degrees above sea-level.

THE EXCAVATION AT EMPERADOR

from the canal, must be held in its own valley by a twenty-mile dam along the hill slope and above the canal. With this exposed embankment standing as the sole protection to the canal, the danger from torrents is apparent. If the river can be diverted from its present valley, the gravest objections to a low-level plan will be removed and from three to six locks eliminated.

The Commission has made careful studies to determine if such a diversion would be practicable. All across the Isthmus, American engineers in khaki, many with the huge straw hats worn by the natives, are making borings and running surveys to secure the fullest data less excavation will have to be made in the central section. But the cost of making a dam to hold a ninety-degree level, together with the necessary locks, reservoirs, and spillways, may more than counterbalance this economy. Here the best selection cannot be made until more complete data are in hand. Latest information indicates that solid foundations are twenty or more feet deeper than the last Commission reported.

These two problems, therefore, had to be solved before even the final plan of the canal could be determined. Enough data have recently been secured to settle the height of the summit level. A way has been found

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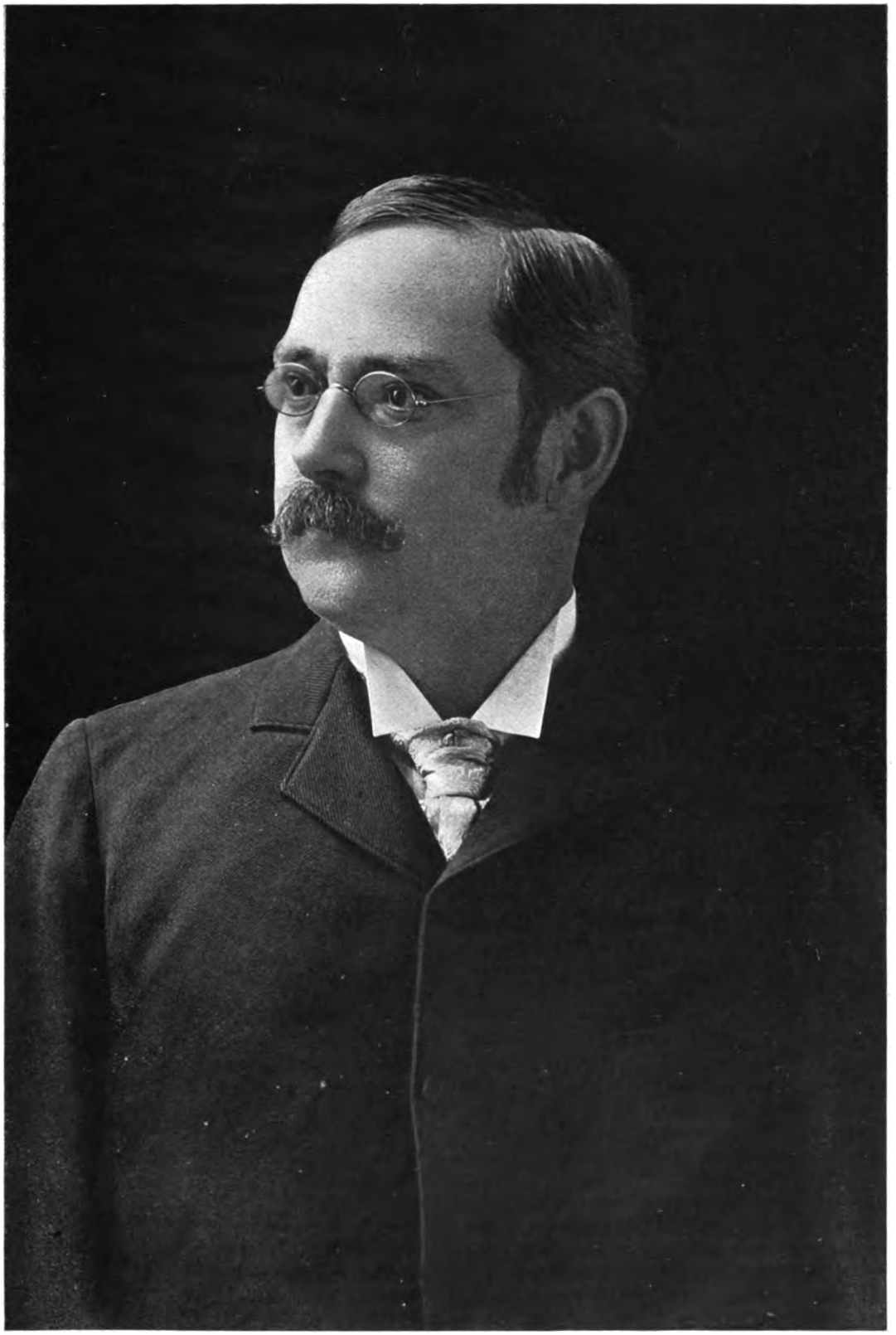

MR. JOHN FINDLAY WALLACE

CHIEF ENGINEER IN CHARGE OF THE CONSTRUCTION OF THE PANAMA CANAL, AT A SALARY OF £5000 A YEAR

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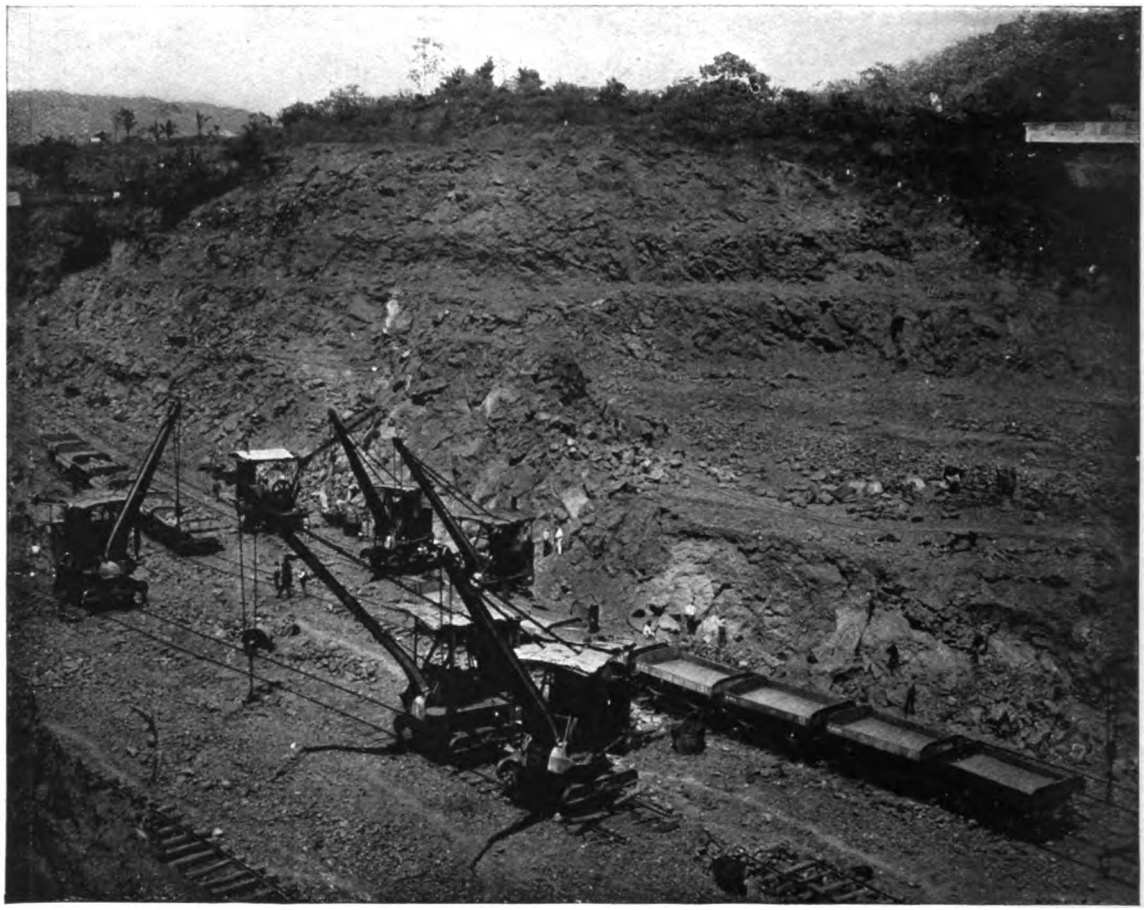

IN THE CULEBRA GAP

by which the constant menace of the Chagres flowing above and parallel to a low-level canal can be obviated, but the amount of material to be excavated upon the sea-level cut, with its one indispensable tide lock near the Pacific end, is almost twice that required for a two-lock canal at a thirty-degree level.

There has long been a strong feeling that, since the canal was to be constructed for posterity, it would be wisest to make a sea-level canal, even at added expense—the estimated cost of a sea-level canal is £60,000,000, as compared with £40,000,000 for a 90-ft. level canal; the former would take twenty years to complete, or ten years more than a canal with locks. The Congress of Engineers in Paris, before whom, under the presidency of Ferdinand de Lesseps, the question of the Isthmian Canal was first debated, had decided almost unanimously in favour of a sea-level canal. After four years of work new plans were adopted, this time for a lock canal, which was to earn sufficient money to refill the coffers of the company. Two years later, in 1889, came the failure of the company and the original project was abandoned. The first American Commission pronounced it possible, but advised against it.

Within limits, we now know just about what will be done. The bottom width of the cut will be 200 ft. and the depth 40 ft. The Suez Canal, averaging 115 ft. wide at the bottom and permitting a draft of only 27 ft. 10 in., has proved too small. Several of the great new battleships of the British Navy can now go through it only with hazard, and none of the larger freighters fully loaded, such as have proved most economical for the trans-atlantic trade, could go through. Even the larger German liners trading to the Orient often lose their steerage-way and sheer against the sides. The Panama Canal will be able to admit even larger vessels. There must be one lock—a tide lock—near Miraflores, and possibly one at Bohio to reduce excavation.

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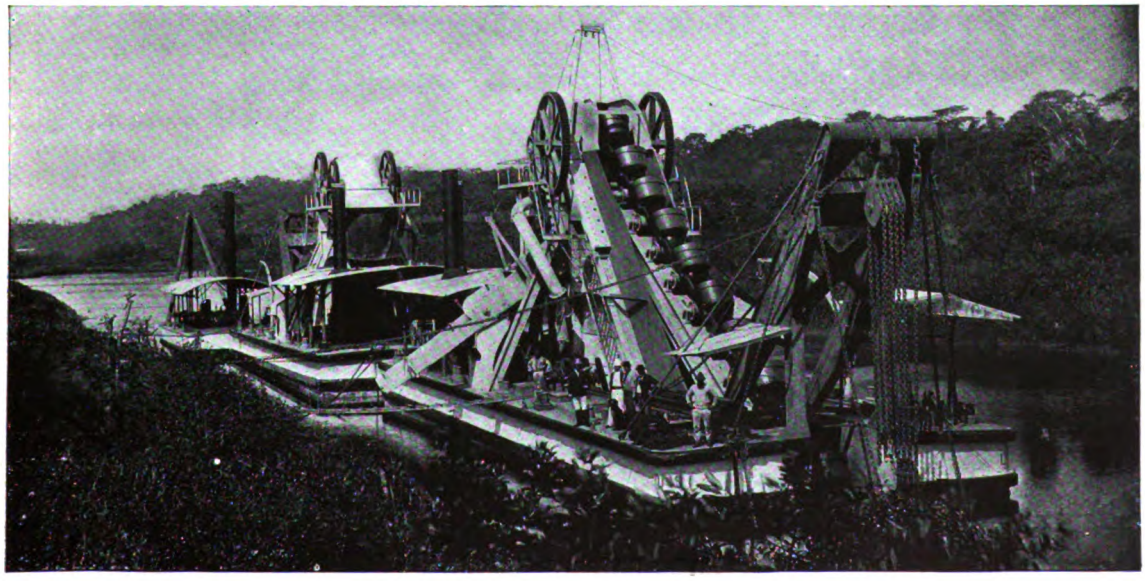
The Chagres will be regulated by dams and diversions. The great Bohio Dam, as planned by the last Commission, from foundation to top would be 200 to 250 ft., with 150 ft. of it below the ground level. The canal's Atlantic terminus will be near Mindi at the head of Limon Bay. The old entrance, planned by engineers who never had to calculate upon such vessels as the *Baltic*, the battleship *Virginia*, or the gigantic new Cunarders, is **S**-shaped, the entering curves each only three-quarters of a mile long. A large modern freight or passenger steamer must slow down to such a speed as to lose steerageway, if obliged to round a curve of a radius less than a mile. The change in the location of the Atlantic terminus will put that gateway to the Canal two miles from the city of Colon.

These facts will be significant in the political relations of the United States and Panama. Among the people of Panama there is already vague talk of an impending change at the Atlantic entrance of the canal; of a new harbour, two miles back from Colon, protected by breakwaters to be built across Limon Bay, leaving the city only its present open roadstead; of new depôts on a gigantic scale planned for La Boca on American ground. There are rumours of a great naval station on the islands in Panama Bay, with dry docks for the largest vessels, which will give the United States the fortress in the South Pacific that Blaine sought vainly to establish at Chimboté.

America's arrival in Panama probably means the founding of new cities at the canal entrances rivalling the two main cities of Panama. At these ports will be the coal depôts and thus the mooring places for transit steamers. The great wharves for the storage of freight will be all on the Zone, and these cities will be owned and governed solely by the United States.

The cities of Panama and Colon have been children of the Panama Railway. It is only because they stand at the two gateways of the land passage across the Isthmus that they exist as they are to-day. But there will be no reason why the ships passing through the new canal should utilise the unprotected roadstead of Colon or pass around the point to anchor in shallows of Panama.

By what machinery of organisation the whole canal problem will be ultimately dealt with, is still undetermined. When the present Commission was formed, a member remarked pessimistically that they would all be investigated and removed by 1906. As a matter of fact, the original Commission of seven members has served the purpose well. It has investigated and laid foundations in a conscientious and businesslike manner. The ceremonies and formal drives of inspection parties, interspersed with elaborate lunching and counter-lunching of officials, such as invariably in Europe accompany and clog the progress of an important commission, have been absent. But while this Commission has served excellently for spying out the land, a more compact organisation will undoubtedly be adopted for the actual digging of the canal.



A DREDGE USED BY THE FRENCH ENGINEERS

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R. Haines

EARL CAWDOR, J.P., D.L.

THE FORMER CHAIRMAN OF THE GREAT WESTERN RAILWAY COMPANY, WHO NOW BECOMES FIRST LORD OF THE ADMIRALTY

A new photograph, now published for the first time

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R. Haines

THE RIGHT HON. WALTER HUME LONG, J.P., D.L., M.P.

WHO SUCCEEDS MR. WYNDHAM AS CHIEF SECRETARY FOR IRELAND

A photograph taken in the uniform of Colonel commanding the Royal Wilts Imperial Yeomanry

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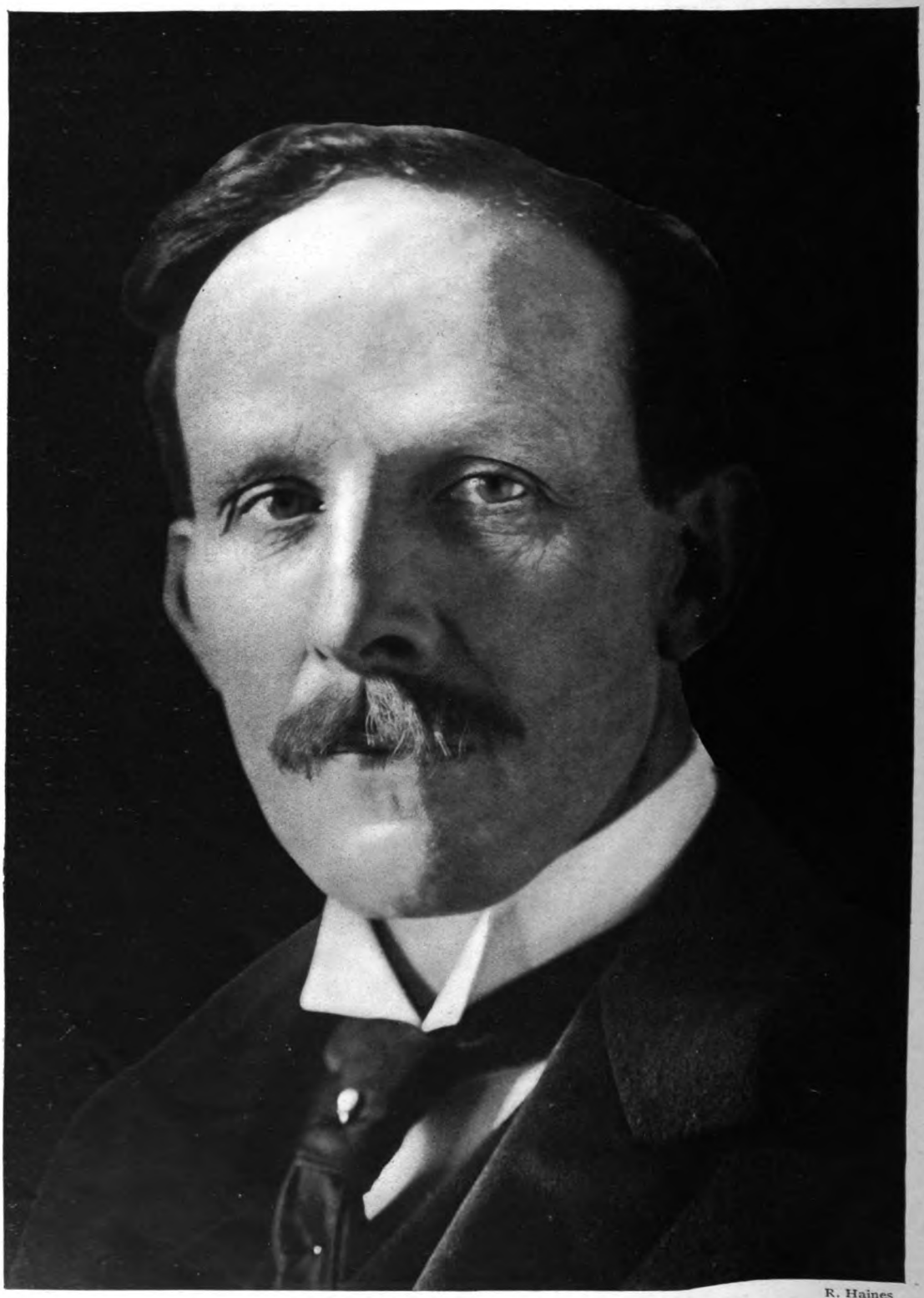

R. Haines

THE RIGHT HON. THE MARQUIS OF SALISBURY, C.B.

WHO SUCCEEDS MR. GERALD BALFOUR AS PRESIDENT OF THE BOARD OF TRADE

A new photograph, now published for the first time

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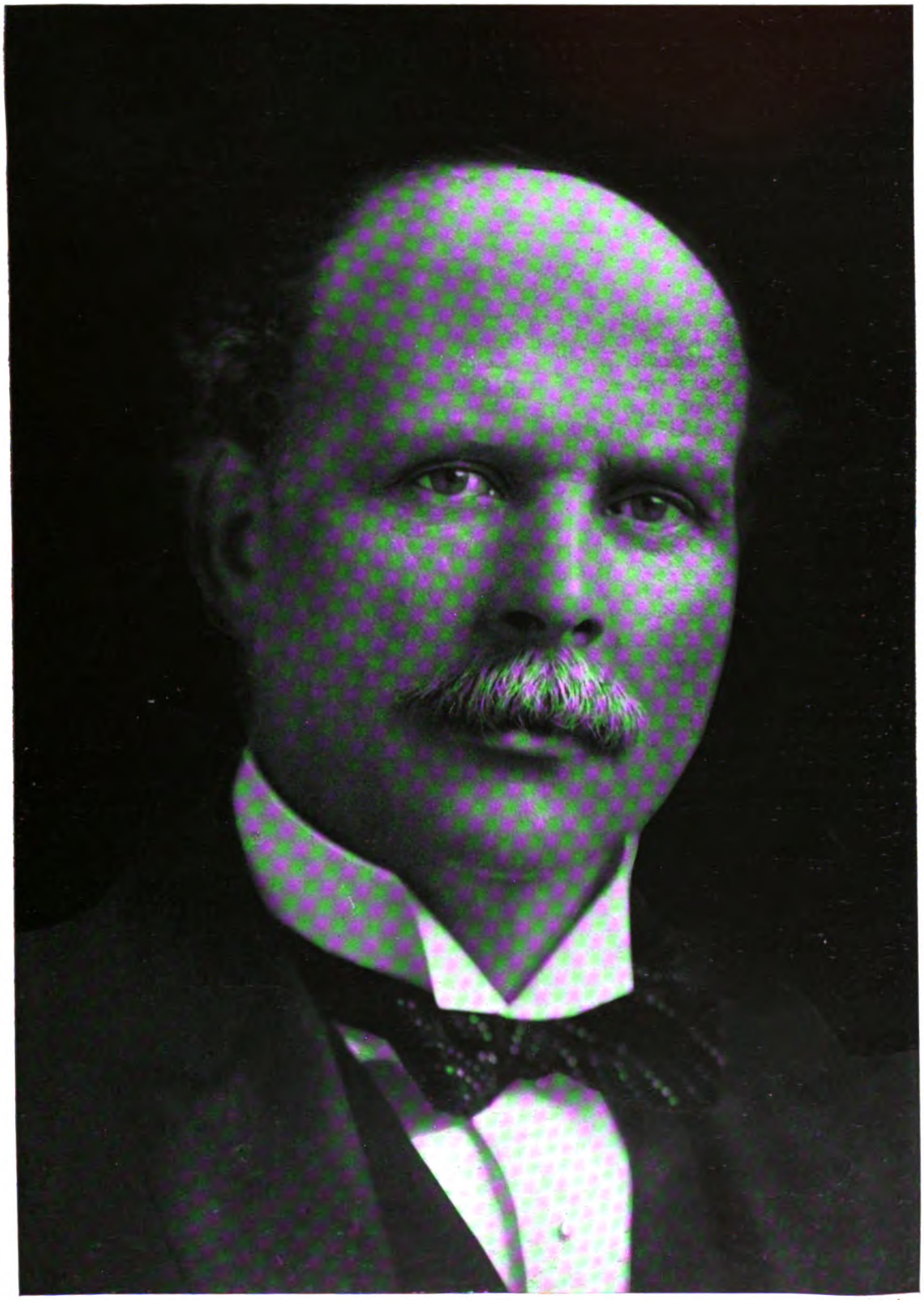

Beresford

MR. H. E. KEARLEY, J.P., D.L., M.P.

AN ACKNOWLEDGED PRACTICAL EXPERT UPON THE SUGAR CONVENTION, WITH WHICH HE DEALS IN THIS NUMBER

A photograph specially taken for THE WORLD'S WORK AND PLAY

[*See page* 480

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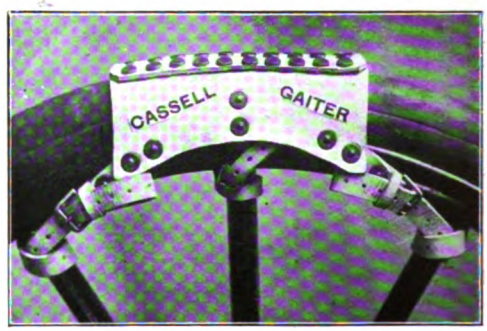
THE PREVENTION OF MOTOR SIDE-SLIP

ARE NON-SKIDDING DEVICES EFFECTIVE?—OTHER CONSIDERATIONS—THE QUESTION OF COST—SOME FACTS THAT ARE FORGOTTEN—WHAT IS RESILIENCE?—LEADING TYPES OF NON-SKIDDING DEVICES COMPARED—THE BEST METHOD OF FITTING

BY

AN AMATEUR

"DO they prevent side-slip?" is the probable query which the average man would put when asked to consider the feasibility or otherwise of having non-slipping treads or kindred devices fitted to the tyres of a motor vehicle. Unfortunately the problem does not end here. Long experience has shown that when discussing any new invention, the chief point to consider is not so much whether it fulfils the object for which it is mainly designed, but whether it brings in its train any disadvantages which are not possessed by whatever it is meant to supersede. One had ample experience of this in the days of the cycling "boom," when the Patent Office was besieged with all manner of inventions to the tune of no fewer than seven thousand in one particular year. One got tired of questioning whether they fulfilled their object, for in many cases, inasmuch as the whole effort of the inventor had been concentrated on that single issue, it was not difficult to show convincingly



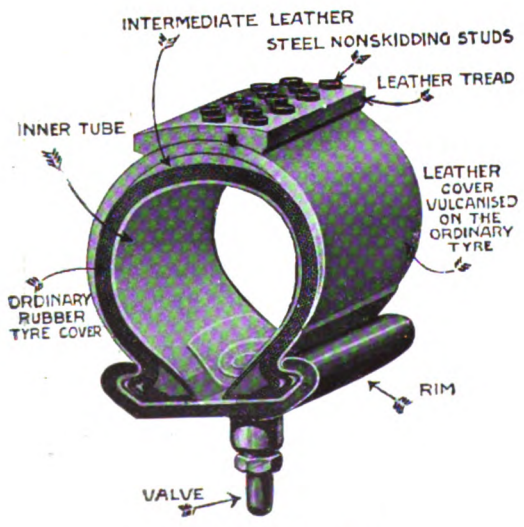
THE CASSELL NON-SKID GAITER

(Glasgow Motor Tyre Co., 71 Waterloo Street, Glasgow)

enough that his object was attained; but it is hardly too much to say that in the majority of such cases the alleged improvement was a step backwards, embodying as it did faulty features in other respects which more than vitiated the value of the improvement in the one detail.

It is not enough, therefore, to ask whether non-skidding appliances really prevent side-slip or not. It may be postulated that they do so in greater or less degree according to individual types, the excellence or otherwise of the way in which they are fitted, and whether they are new or partially worn. Certainly the man whose car is fitted with any non-skidding device worthy of the name may drive with infinitely greater confidence over greasy streets than if his tyres are perfectly smooth. But though the use of one device or another is greatly on the increase, there are still large numbers of automobilists who fight shy of having anything of the kind.

In the first place, non-slipping attachments are mostly costly. When a man buys a motor-car, he selects, as a rule, the very



THE SAMSON TREAD

(Theo. Marni, 1 Hanover Court, Hanover Street, W.)

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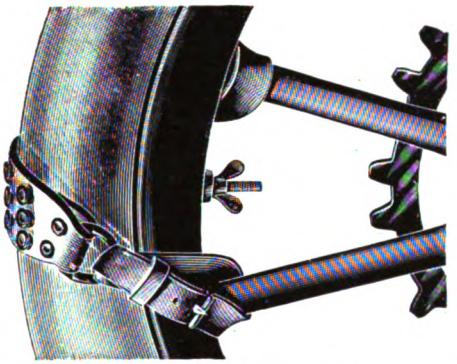
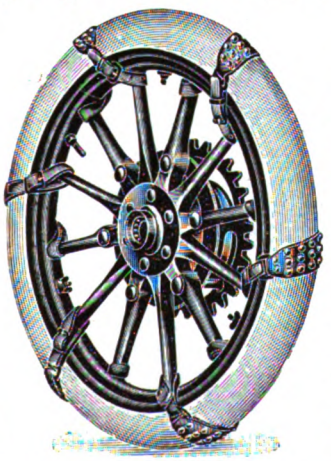


THE SIMPLEX NON-SKID
(London Motor Garage Co., Ltd., 33 Wardour Street, W.)

best that he can afford, and then finds that he has still numerous more or less expensive accessories to add which are essential to the proper equipment of the vehicle. To go still further, and order non-skidding treads costing several pounds apiece, is a thing which many are unprepared to do; and once a car is delivered there is not much likelihood of non-skids being acquired at a later period, as it is notoriously injudicious to add anything to a partially worn tyre.

Another consideration of great importance is undoubtedly that of efficiency—not of the non-skidding attachment, but of the tyre *quâ* tyre. It is an axiom that anything which is incorporated in a pneumatic tyre, designed as such, impairs its value to no small degree. Perhaps nothing is more astonishing to the experienced road-traveller than the ignorance of many automobilists as to the essential features of the pneumatic principle. Cyclists well remember how the bicycle-tyre year by year got thinner and thinner in tread and walls alike, until it appeared to have been reduced to the irreducible minimum; whereupon one company went still further and produced a tyre with naked sides. The thinner the tread, and the more flexible the walls, the more quickly the tyre yields under pressure, and thus gives the compressed air within a chance to exert itself and rebound with lightning rapidity. This is resilience, a quality which hundreds of inventors and thousands of automobilists have failed to understand. Every man who brings out a new form of solid tyre, or a tyre with a small amount of air inside at *atmospheric* pressure, is prepared to swear by all his gods that his particular product is as resilient as a pneumatic inflated to a pressure of sixty pounds, or even more. It should be obvious, however, that the more the outer cover is stiffened the less is the capacity of the tyre to absorb irregularities of the road-surface; as a result of which, it has to be drawn bodily over the obstruction like a solid tyre, instead of, as it were, swallowing it up in passing.



THE SIMPLEX COMPLETE

It unfortunately happens that the motor-car pneumatic tyre has of necessity to be made

LEMPEREUR
(Mann and Overton, 7A Lower Belgrave Street, S.W.)

in much more substantial form than the cycle tyre, and suffers as to its resilience in consequence. To prevent too easy access to the lurking nail or thorn, and too rapid surface abrasion owing to the speed at which the car can be driven, a considerable amount of substance in the tread is indispensable, while the walls themselves have to be strong enough to resist the expansion of the air within which comes from heat, and the bursting strains due to the weight of the car itself. The motor-car tyre of to-day represents, in the amount of strength and substance which it contains, the result of years of experiments and experience, every individual size being carefully calculated to carry a given load per wheel, and to give the best results which it is possible to obtain in the way of resilience, speed, and durability alike.

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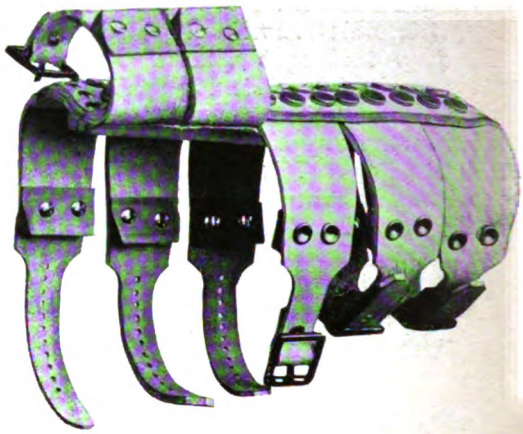
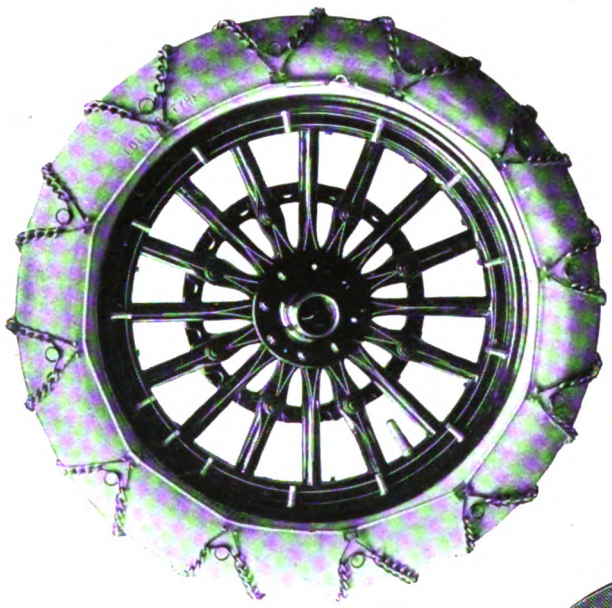
To go still further, and add a leather or metal tread, or a combination of the two, is terribly repugnant to all who have followed the development of the pneumatic tyre.

Wherefore the automobilist finds himself on the horns of a dilemma. Side-slip is an ever-present possibility on roads which, through our fickle climate, are so frequently coated with grease, and upon which the water-cart fiend does his dirty work when we are fortunate enough to have a spell of fine weather. In time to come, of course, as horses are gradually eliminated, and the disintegrating effect of the pounding action of their hoofs on the road



THE COUPE DOUBLE-PURPOSE TYRE GAITER

(E. H. Hill, Beta Works, Sheffield)

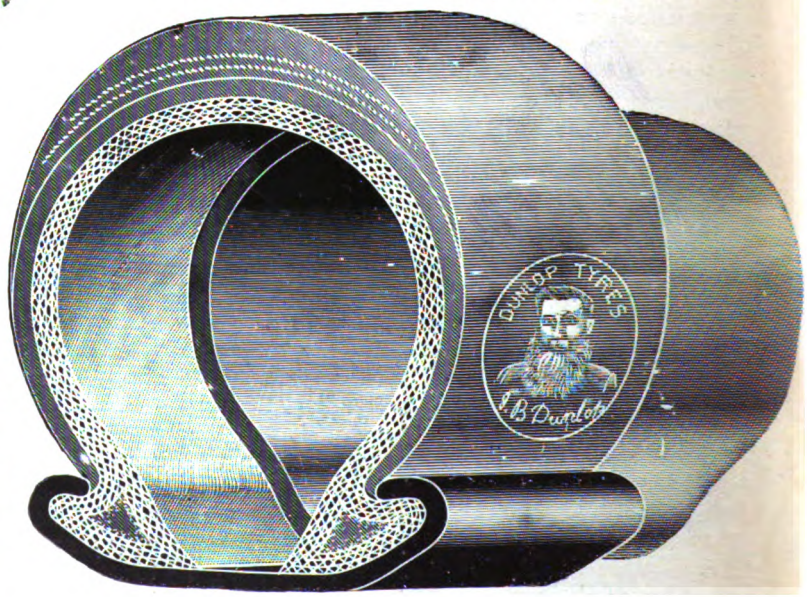


THE PARSONS CHAIN

(Parsons Non-Skid Co., Ltd., 175A Manor Street, Clapham, S.W.)

crust disappears, our highways will be much less greasy even after rain; but meanwhile, the presence of grease is a constant and inevitable possibility. Automobilists may therefore be divided into two camps—those on the one hand who prefer to take all chances on the plea that careful driving is sufficient to cope with all emergencies, and on the other hand those who elect to err on the side of caution and adopt some form of non-slipper as a necessary evil. There is no doubt as to the latter class being in the happier position so far as comfortable driving is concerned, for they can proceed with much greater confidence generally, and in traffic with much more expeditiousness than their brethren who depend upon smooth tyres.

Roughly speaking, non-skidding devices may be divided into three classes as follows: (1) those which are purely mechanical; (2) those which are permanently affixed by vulcanisation to the tyre-cover; and (3) those which, though substituting an extra tread, are nevertheless capable of detachment. In the first category the most successful device, both practically and commercially, is undoubtedly the Parsons Non-Skid. This is formed of a series of curb



THE DUNLOP NON-SLIPPING COVER

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chains placed obliquely across the tyre, the ends being fastened to a couple of loops which are adjustable to the size of the wheel employed. These loops are constantly undergoing a slight creeping process round the tyre as the wheel revolves—with this advantage, that instead of the chains constantly pressing on to the tyre at particular points, they are really continually on the move, so that the tread of the tyre comes in direct contact with the road. If a greasy surface is encountered and the wheels begin to skid—in other words, cease to revolve forwards, but attempt to move sideways instead—the chain which is nearest to the road at that particular moment falls by gravity, and the slack portion interposes itself between the two slippery surfaces of the road and the tyre respectively. The wheel then obtains a firm bite, the skid is interrupted almost as soon as it is begun, and the threatened sideway movement of the car is averted. The main advantage of the Parsons device is that, when not required, it can be removed bodily, and the driver who sets off in fair weather may enjoy the satisfaction of driving on plain tyres. If he unexpectedly encounters a greasy surface, he may step down and affix his non-skids; and it is said that after a little practice the process becomes so expeditious as not to be regarded as in any way irksome. Then, again, the Parsons device, even when in use, does not affect the resilience of the tyre. Against these advantages are to be set the fact that the chains are liable to rust and break, and sometimes in the act of breaking do damage to the car; with the chain-driven variety, in fact, they may even get mixed up with the driving-chains. It can scarcely be said, moreover, that the device in any way improves the appearance of the vehicle to which it is attached. Still, it has much to recommend it, and has now many friends.

The second class of non-skidding devices is decidedly the most numerous, especially in one particular form, namely, that of a leather band into which a number of round metal studs are fitted. The Samson, Grose, and Sawyer are typical examples. On the Continent the Samson device has become extraordinarily popular, and quite a large trade has been developed in the fitting of these treads. It has two great advantages over appliances which seem at a casual glance to be precisely similar. In the first place, the leather tread does not completely encircle the tyre-cover, which fact of itself confers two benefits. The fact that the cover is not stiffened the whole way round by the additiona leather impairs the resilience to a less degree than when that plan is followed; moreover, it is an undoubted fact that the passing of the leather right round the beaded edges forces these further into the rim, and reduces the intervening space between the edges in the channel, thus increasing the probability of the inner tube being nipped and ultimately bursting. But what experience has practically taught the makers of the Samson tread is that as resilience is lost, and over-heating caused, by too great a stiffening of the cover, they are now making a practice of fitting the leather band—not to a full-bodied tyre, that is, with its reinforcement of rubber, or *croissant*, as the French term it—but to a plain cover without any reinforcement. In other words, the ordinary motor-car heavy tyre differs from a cycle tyre in having first a complete envelope of rubber round the fabric, and then an additional tread of rubber vulcanised on to that. This extra tread is now dispensed with, and big houses like the Michelin and Continental firms, who have hitherto been loath to see non-slipping treads affixed to their tyres at all, have now recognised the value of this compromise, and have made large contracts with the Samson firm to supply tyre-covers without any reinforcement, with a special view to the adding of metal-studded leather bands. As a result, a combination is produced by which the cover is not so very much stiffer than the ordinary heavy one with its *croissant*, while the probabilities of over-heating are correspondingly reduced.

The Grose and Sawyer bands are very similar to the Samson, but carry the leather right over the beads, a method which has the objection I have already pointed out. To overcome this, it would be necessary to manufacture the tyre-cover with narrower beaded edges than usual; meanwhile, particular care must be employed whenever a cover and tube come to be fitted to a rim, or a tube is replaced after removal for repairs. Another type of band in which the leather is carried to the rim is the Desclée. This differs from the Samson, however, in the formation of its tread, which contains a row of steel plates instead of the round studs. The band is secured by steel lugs which hook into the rim of the wheel. The Pullman band has studs of hobnail form, instead of the round discs of the Samson and similar types. Naturally, the hobnails obtain a particularly effective grip of the ground while new, just as do the nails in the boots of Alpine climbers; in course of time, however, they a[r].

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bound to wear flat. The Lempereur device is noteworthy from the fact that it gained the first prize of £150 in the Automobile Club's Side-slip Trials, and that it had previously won a gold medal in the trials promoted by the Automobile Club de Seine et Oise. It consists of a series of metal plates attached to a couple of chain loops. For durability it would be difficult to excel this particular attachment, consisting as it does entirely of metal; but it is obvious that it must impair the resilience of the tyre to no small degree, and over roads paved with cobbles must be unpleasantly noisy. Doubtless, it is best adapted to the wheels of cars which are habitually used in all weathers in town traffic; at the same time it is easily detachable. An entirely different type is the Wilkinson non-skidding tread, in which a number of wire staples are embedded in three parallel rows. They remain *in situ* much longer than might be expected, and while new are remarkably effective; their chief drawback, however, is the rapidity with which the projecting ends of the wire staples wear down to the level of the tyre, with a corresponding reduction of efficiency where non-skidding is concerned. Some automobilists prefer as a half-measure of protection a device like the Simplex, which is inexpensive, and does not seriously affect the construction of the tyre. It consists of a small band about three inches across, which is strapped round the tyre and rim. A set of six is said to be sufficient for the purpose. Of course, they do not offer a continuous non-skidding tread, but should be more effectual than a plain tyre.

Few tyre-makers, as yet, have seriously tackled the question of side-slip themselves by turning out non-skidding covers which do not require an extra attachment to be fitted later. The Dunlop Company, however, make a non-slipping cover with transverse grooves, which is undoubtedly the best thing that has yet been produced from a tyre factory direct. It is perhaps less drastically effective than the non-skidding covers with metal projections, but is certainly better than a plain cover, and is only subject to the disadvantage of wearing smooth in course of time.

Many questions remain to be considered even if agreement is arrived at as to the best form of non-slipping attachment which can be fitted. Evidence is singularly wanting, as yet, as to the length of time which even a well-vulcanised tread will last, because so much naturally depends upon the type of car to which it is attached, the speed of which the car is capable, and the skill or otherwise with which the owner habitually drives. Naturally, the man who is constantly dependent upon his brakes for pulling up, instead of driving mainly on the clutch, will wear out his non-skidding treads, just as he would plain tyres, much more rapidly than a good driver. It is to be feared, however, that with any but a low-powered car the life of these treads is not so long as could be desired, even with skilful driving, and their use or otherwise depends entirely upon the degree of importance which the individual driver attaches to immunity from side-slip. To many people, however, side-slip is so great a bogey that they are prepared to pay a good deal for the luxury of being free from fear.

Now after the factors of type and cost, the most important question, perhaps, is that of how the non-skidding attachment shall be applied. Some drivers consider that one is sufficient on either of the driving-wheels. Others —and this is the better method—fit the non-skids to both the driving-wheels. Certain it is, however, that even with adequate protection on the back wheels the front wheels will still skid on a very greasy surface, and this is of particular importance when corners have to be negotiated. No new fact was so strikingly displayed at the Automobile Club's Side-slip Trials as this inability of a car, even when duly provided with non-skids on the back wheels, to effect a turning movement at bad corners; the front wheels simply skid bodily forwards, and the car does not turn at all, the non-skids on the back having no other effect than to act as a sort of brake. It is in consequence of this that some drivers try the effect of fitting a non-skid on one back wheel and another on one of the front wheels—generally on opposite sides of the car. This enables the turning to be effected with more ease than if the front tyres were plain; but it affects to some extent the simplicity of the steering, and throws an unequal strain on the differential and the steering gear alike.

At present there is no sufficient evidence on which to base anything in the shape of final conclusions. One can only continue to experiment. I do not profess for a moment that my own theories are correct; but my individual experience, at all events, has led to my adopting the following plan on a new car of which I am now daily expecting delivery, and that is to have leather and metal bands vulcanised on the rear tyres without *croissants*, and on the front wheels to employ non-slipping covers which come from the tyre factory direct.

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SHALL WE TAX LAND VALUES?

I.—"NO"

THERE IS NO MONEY TO BE OBTAINED FROM A SPECIAL TAX ON LAND—HOW SUCH A TAX WOULD AFFECT GROUND RENTS AND THE HOUSING QUESTION—THE IDEAL TAXES—FALSE ECONOMICS

BY

HAROLD COX

THE special taxation of land values is advocated on two grounds—(*a*) that it will tap a new source of revenue, (*b*) that it will help to solve the housing problem.

With regard to the first point the best answer is furnished by the Minority Report of the Royal Commission on Local Taxation. This report is constantly claimed, by people who have not read it, as an unanswerable authority in support of every crude scheme of land taxation submitted to Parliament or to the public. As a matter of fact, the Report condemns all these schemes. The verdict is summed up in the following words:

"We feel bound, for the reasons which we have explained, to condemn unhesitatingly all the schemes which have been put before us in connection with the rating of site values."

After this sweeping condemnation, the Minority proceed to express their approval of the principle of a special tax on land values and to put forward a scheme of their own. Their final argument in support of this scheme is:

"It would, or at least it should, conduce to the removal of some of the widely spread misconceptions which seem to prevail, not only in political circles, but among economic authorities and responsible statesmen; for, while it would be an admission that there were defects in the urban rating system and an attempt to remedy those defects, it would show that there is no large undeveloped source of taxation available for local purposes, and still less for national purposes."

In face of these words the advocates of special land taxation must do one of two things, either they must cease to appeal to the authority of this Report, or they must admit that there is no money to be obtained by the taxation of land values.

The reason why there is no money to be obtained can be easily made clear. The proposed tax is a special tax limited to one class of property. It must, therefore, be a very small tax, or a cry of confiscation will be raised, and in face of that cry the scheme would become politically impossible. There may be some people who imagine that the cry of confiscation can be disregarded because the owners of land are "great noblemen" who have no votes except in the House of Lords. That is not the case. The ownership of land is very widely diffused through all classes of the community. Bankers, building societies, insurance companies, and trustees without number, are all interested in incomes derived from land. A special tax on land values would diminish these incomes while leaving other incomes, as large or larger, unscathed. The injustice of such a proceeding, unless the tax were insignificant in amount, would be so glaring that no Government would dare to make the proposal. The position may be put in a sentence. Brown derives £100 a year from freehold ground rents, and Smith derives the same sum from Consols. Both incomes were originally purchased by the investment of capital; both have to be annually provided by the labour of the community. Why should Brown be taxed, while Smith goes scot free? That question cannot be answered so as to satisfy the moral sense of the nation either by quoting Henry George or by inventing a metaphysical distinction between land and other forms of wealth. Land has been treated as a merchantable commodity in this country for centuries. It would be a monstrous injustice if the State were now suddenly to intervene and say that A who has just bought a piece of land shall be specially taxed, in order to lighten

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the taxes on B who has just sold the land and pocketed the price.

Any special tax on land must therefore be so small as to be negligible, and in that case the revenue to be derived from it will be negligible also. If any further doubt is felt on this point it can be satisfied by a perusal of the Bill which passed its second reading last session. The essential principle of this Bill was that existing contracts must be respected. No other measure would have the smallest chance of being adopted by either House of Parliament. But the maintenance of existing contracts means that those persons who have contracted to pay all rates, present and future, must pay the new land values rate whatever it may be. In other words, the new rate will fall on existing ratepayers. I wonder how many of the Members of Parliament who went into the lobby with Mr. Trevelyan have yet explained to their constituents that this would be the effect of the measure for which they voted.

Mr. Trevelyan's Bill, instead of getting at the huge incomes which owners of ground rents and feu dues are supposed to enjoy, would leave these incomes absolutely untouched. It would also leave untouched the incomes derived from speculation in stocks and shares, or in coal or cotton. It would leave untouched the profits reaped by the owners of tied houses, by the promoters of fraudulent companies, and by the exploiters of Chinese labour in the South African mines. Except in the rare case of absolutely unoccupied land, the only person who would pay a penny more would be the very person whom the Bill professes to relieve, namely, the existing ratepayer.

That is not all. If the new rate were to be evenly distributed over the whole body of ratepayers, the public might accept it with patient but puzzled acquiescence. But the new rate will not be evenly distributed. It will only fall on ratepayers living in the centre of the town, and will relieve from taxation ratepayers and property owners in the suburbs. Incidentally—as was clearly explained by the Royal Commission—it would actually lead to a rise in the value of suburban land. Struggling ratepayers in the centre of our large towns will have to bear a new burden, in order that landowners in the suburbs may get a better price for their land. And this is the scheme which people who have never even read the Bill want to father upon the Liberal Party. Its authors may have the best intentions in the world, but the whole financial effect of their proposals would be to put money into the pocket of Paul while wantonly robbing Peter.

Next let us consider what effect the taxation of land values would have on the housing question. A good many people, when they discuss the housing question, appear to forget that capital as well as land is required for the construction of houses. At present the possibility of a rise in the value of the land makes it easier to obtain the necessary capital for building the house. The following is an extract from a letter received the other day from a prominent Liberal:

> "It is quite a common practice in Lancashire and near Liverpool for a builder to take a plot of land, and after building the cottage sell the land and cottage at such a price as would on the cottage itself show a loss, but which with the profit on the land produces a slight profit. In some districts where ground rents are the rule, the lease being generally for 999 years, this operation is more easily carried through than where freeholds are the custom."

The above extract was written solely with regard to a practical scheme for building cottages in the country, and was not intended to have any application to the general question of taxing land values. The application is, however, obvious. If we put any special tax on land with the object of intercepting what is known as the unearned increment, we shall check this motive for building cottages, and thus add to the present housing difficulties. The same point can be illustrated in another way. It is a common practice among builders to raise capital by the creation of ground rents. As soon as the house is built a ground rent is created, and is secured upon the land and the house. This ground rent has no necessary relation to the economic rent of the ground. It is merely a device for raising money, and is commonly fixed at one fifth of the letting value of the house. At present, trustees and insurance companies are willing to pay a high price for such ground rents because the income is fixed and the security ample. If, however, a special tax is imposed on ground values, to be varied in amount according to the requirements of local authorities, ground rents will cease to yield a fixed income and will cease to be a trustee investment. As a necessary consequence builders will have to pay more for the capital they require, and a further obstacle will be placed in the way of production of houses.

As against these objections the land taxers

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allege, that by specially taxing land they will force more land into the market. But is that so? It has already been shown that any special tax must be an extremely small tax, for otherwise the cry of confiscation would be raised. But small causes have small effects. At present an owner who is holding land for a rise is losing every year the interest on his capital. He faces that loss in the hope of a future profit, and the same motive would induce him to submit to a small increase in his annual loss, in the shape of a small tax, rather than let the land go at a lower price than he believes it to be worth. Thus a small tax would only bring into the market land that was already almost there. It would not touch the cases, which figure so prominently in the popular imagination, of land deliberately held up for many years in the hope of a big rise.

Moreover, even in those cases where estates were sold in consequence of the tax, it does not follow that the land would be built upon. It might merely pass from a weak holder to a strong holder. For it is important to note that the whole burden of the new tax, whether large or small, would be discounted by the purchaser. The price paid by him would be reduced by a sum equal to the capitalised value of the tax to the end of time. The whole loss would fall upon the vendor, and the purchaser would find himself in the same position as if there had been no tax. He would indeed have to pay the tax year by year, but that would be made up to him by the saving in annual interest on his purchase money.

To make this point still clearer, let me take the case of a piece of unoccupied land with a selling value of £1000, and in order to simplify the argument assume that the land is in the possession of the freeholder, and that there are at present no rates upon it. Taking interest at 4 per cent., it is clear that the owner of this land is losing £40 a year while holding it for a rise. Under Mr. Trevelyan's Bill the land would be assessed at 3 per cent. on the selling value, *i.e.*, at £30 a year, and the full local rate would be levied on that assessment. Taking the local rate at 6*s.* 8*d.* in the £, which is not nowadays a high average, it will be seen that the effect of the Bill would be to impose on the owner an additional loss of £10 a year over and above the £40 that he is already losing. If he is a poor man, this additional charge will possibly compel him to sell. But he will no longer be able to obtain £1000 for the land. The purchaser will take into account the charge of £10 a year with which the land is now burdened. Capitalised at 4 per cent., this charge amounts to £250. So that the full price that the land will now command is reduced to £750. At one stroke the property of this unfortunate individual has been reduced by a quarter. I will not pause to comment on the gross injustice of such a tax. My whole point for the moment is, that even this sweeping measure of confiscation would not prevent the holding up of land. For the new owner having acquired the land for £750 is only losing in interest £30 a year. This, added to the £10 for rates, brings his annual loss up to £40, which is exactly the loss that the previous owner cheerfully bore in the hope of a future profit. There is no more inducement to develop the land than there was before. All that has happened is that the original holder has been robbed of a quarter of his property, and that a new holder has stepped into his shoes, having first discounted the whole of the tax.

If this argument has been followed it will be seen that, in the case of land held for a rise, the only certain effect of a special tax would be to transfer land from weak holders to strong holders. The idea that houses can be created by taxing land is about as intelligent as the protectionist belief that the nation can be made richer by excluding the goods that other countries are willing to give us.

Let us have the courage to face these land problems directly. Do not let us try to escape trouble and responsibility by employing boomerang devices which will strike where the blow is least expected. If land is being deliberately withheld from the market in places where house-building is desirable in the interests of the public, the local authority should have power, after proper inquiry, to compel a sale. On the other hand, it is even more important that the local authority should have power to prevent building on land required for an open space or for the preservation of the amenities of urban life. These are things that should be done by direct action, not left to the uncertain operation of any tax.

I submit that the primary object of taxation is to raise a revenue for the State, and that we run grave risks whenever we depart from that principle. Equally grave are the risks we run when we depart from the principle that men should be taxed according to their means of payment. The two ideal taxes are an income tax and a death duty. The one taxes the man on the actual income he enjoys; the other takes toll of the capital as it passes to

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the heir. Both of these taxes at present apply equally to land values as to other forms of property. To that extent they are fair. Both the income tax and the death duty are, however, capable of improvement. The defect of the income tax is that it only applies to a small portion of the community, and that the scale is insufficiently graduated. The defect of the death duty is, that it is not high enough, and that it is too easily evaded. Those defects can be removed, and both taxes can be applied, with certain necessary modifications, to local as well as to national purposes. If this were done we should be able to sweep away all taxes on such wholesome commodities as tea, sugar, coffee, and cocoa, and to prevent the further expansion of local rates by substituting a more equitable means of raising revenue. These are things worth doing. They would place our national and our local finances on a sure basis, and they would bring us very near to the ideal of obtaining from every citizen a contribution to the expenses of the State in proportion to his capacity for payment. On the other hand, these proposals for the special taxation of incomes derived from land are founded on false economics, and are only commended to the unthinking by delusive promises of plunder. Like all schemes based upon injustice these also will end in dead ashes.

II.—"YES"

CASES IN LONDON, MANCHESTER, AND EDINBURGH, AND THEIR MORAL—THE TAXATION OF URBAN LAND VALUES WOULD RELIEVE THE RATES, CHEAPEN BUILDING LAND, AND HELP TO SOLVE THE HOUSING PROBLEM

BY

T. J. MACNAMARA, LL.D., M.P.

I CANNOT pretend to be what is known as a scientific economist. But I do claim to have watched two problems pretty acutely for the last twenty years.

The first is the problem of Local Rate Charges; the second is the problem of the enormously increasing value of Urban land. And concerning these two problems I have arrived at a very definite conclusion, namely, that there is a direct relationship between Rate expenditures and Urban land values; and that this relationship is the relationship of Cause and Effect.

The ratepayers of any great Urban centre spend their moneys in widening a street, in the opening of a park, in building an Embankment, in developing a tram service, in throwing a bridge across a river, or in boring a tunnel underneath it. What is the immediate result? They enormously enhance the value of all contiguous land, and the landowner becomes the residuary legatee of the great bulk of rate expenditures. Let me take one or two instances. In the year 1865 in London, near the Temple Railway Station, a piece of land on the foreshore of the Thames, used as a coaling wharf, changed hands for £8250. In the years 1869 and 1870 the London ratepayers at very great expense built the Victoria Embankment. In the year 1872 the London School Board wanted a piece of land upon which to build their central offices. They secured, under Parliamentary power, inch by inch the very same piece of land which in 1865 had changed hands for £8250. A jury made them pay £26,420. What had happened in the course of seven years to multiply the value of the land threefold? Of course the answer is the ratepayers had built the Embankment and had given the land an enormously improved frontage. Thus the London ratepayers were hit twice. They were hit for the cost of the Embankment, and then they were hit the £18,000 increased value of land which their expenditure upon the Embankment had created.

Take the case of the Trafford Park Estate. Within the years of its construction the expenditure upon the Manchester Ship Canal raised the value of the Trafford Park Estate from £237 to £4840 an acre. Instances of this kind will occur to the reader of this article no matter in what great town he may be residing.

There is really little need to labour the point. Even those who have land to sell in Urban areas frankly advertise public improvements as an asset in favour of their land. Any one who

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will take up a current copy of any journal publishing advertisements of sale of Urban land will find copious endorsement of the truth of my contention. Perhaps the most brutally frank statement is that of a poster which, not so long ago, was issued on behalf of the Cheapside Land Company. In the course of this document, which recommended the investment of money in Urban land, occurs the following :

"The best investment now is undeniably freehold land. This never shrinks in value. It is ever increasing, and the investment is growing more and more profitable without any effort on the part of the owner. Several of our estates are within the zone of projected electric railways, and are likely to be very rapidly enhanced in value. Buy to hold and sell to profit."

The citizens of every great city are at the present time confronted with two striking phenomena. The former of these deals with land at the centre of the Municipal area. Here it is found that, as the leases fall in, it is possible to create ground rents three or four times larger than the entire rental of the whole tenement before the lease fell in. This is acutely true in the case of London.

The latter phenomenon has reference to the suburban belt which surrounds each of our great Urban municipalities. The great movement from the centre to the suburbs is creating a demand for land for building purposes which is enormously heightened by the provision of rapid means of transit. The result is that all round London, for instance, there is a suburban zone of from five to ten miles from Charing Cross where small estates are being broken up, and before a single brick of the new houses is laid, ground rents to the tune of from £2000 to £3000 a year are at once created on property, the rateable value of which previously—both houses and estate— was not more than from £500 to £600 a year. Our claim is that in these cases the community shall enjoy a share of this unearned increment in order that its municipal purse may be augmented, and the charge upon the ratepayer lightened *pro tanto*.

Another phase of the problem is the extent to which landowners hold Urban land up, paying a ridiculously small tax upon it meanwhile, for the confessed purpose of ultimately enjoying its automatically enhanced value. Take the single case of the land bought some little time ago at Granton, near Edinburgh, by the Edinburgh Town Council for the purpose of erecting new Gas Works. That land was in the possession of the Duke of Buccleuch. It covers 105 acres, partly built on, and was rated at £5 10s. an acre. At thirty years' purchase the Edinburgh Town Council should have paid the Duke of Buccleuch £17,300. As a matter of fact they had to pay him £124,000, or 212 years' purchase value of the land according to its contributions to the rates.

What we propose is that all Urban land should be assessed, apart from buildings, in a separate column of the Valuation List. This proposal, which for many years has been scouted in the House of Commons because of its great cost, if not indeed its impracticability, has been easily and cheaply materialised in many of the Colonies, in many of the German towns and provinces, and, only within the last few months, in the whole of the city of New York.

Having secured our separate assessment of the land, we propose to fix 3 per cent. of the amount for which the land could be sold by a willing seller to a willing buyer as its annual value. Then we propose to compel the full payment of rates in respect of the annual value of the land comprised in each urban area. We do not propose to break existing contracts ; but we propose to allow the occupier under any future lease or agreement to deduct from his rent so much of any rate paid on this basis in respect of land value.

Substantially we follow the line of the Minority Report of the Royal Commission on Local Taxation. This very remarkable Report was signed by the Chairman of the Commission, Lord Balfour of Burleigh ; by Lord Blair Balfour (Lord Justice General of Scotland) ; Sir Edward Hamilton (Assistant Secretary to the Treasury) ; Sir George Murray (Secretary to the Postmaster-General) ; Professor Stuart and Judge O'Connor. These eminent economists recommended :

(1) That site and structure that are now combined for rating purposes differ so essentially in character that they should be separately valued.

(2) That when separated from structure, site is capable of bearing a somewhat heavier taxation and should be made to bear it, subject, however, to strict respect for existing contract.

(3) That the differential treatment should take the form of a special site value rate, and,

(4) That this special site value rate should be charged in respect of unoccupied property and uncovered land.

Like the Royal Commission on Housing in 1885, the Local Taxation Commission to which I am now referring laid great stress in its Minority Report upon the effect of the separate

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taxation of site values upon the Housing Problem. The above-named Commissioners on this point say, and it would be impossible for me to over-rate the significance of this comment :

" While the rating of site values thus concerns the public as an administrative reform, it is of special importance in connection with the urgent problem of providing house accommodation for the working classes. Anything which aggravates the appalling evil of overcrowding does not need to be condemned, and it seems clear to us that the present heavy rates of building do tend to aggravate these evils, and that rating of site values would help to mitigate them. If more of the burden were thrown on sites, the burden left to be borne by building would be diminished, and this would weigh with the builder, who is hesitating to embark on the erection of new structure."

Nobody will be surprised to learn that in this matter of the taxation of land values we are decades behind Continental countries and our own Colonies. Seventy-six German towns and provinces have the system in full operation. So, too, have five out of our seven Australian Colonies. New Zealand has had a National Land Tax of a penny in the pound on the capital value universally applied since 1891, and since 1896 local option has been given to municipalities to levy another penny for local purposes. Sixty-two are already doing this, and there is immediate prospect of the second penny being made universal and compulsory. As to the effect of this local penny tax, I may quote from the report of the Town Clerk of Wellington in his annual report to the Mayor and Councillors for 1902-3. He says :

" The result of the first year's trial of this system of rating must be considered a gratifying one. That which was claimed by its exponents has been amply fulfilled. It encourages improvement, stimulates the use of land, secures the unearned increment to those who have made the value, mulcts all land in their fair share of taxation. . . . It is only stating a fact to say that each if not all of the activities in the building operations of the city and surroundings during the past year is due to the influence of this powerful measure."

I claim for the taxation of Urban land values —I do not propose to touch Agricultural land, because I think that under the present system that is sufficiently burdened—that similar beneficent results would accrue in this country. I claim (1) that it would enable the community to share in the benefit of values which it has itself created, and thereby relieve the burden on the ratepayer; (2) that it would reduce the rate charged on houses, and thereby reduce the burden of the occupying tenant; and (3) that it would bring building land into the market, cheapen it, and therefore substantially affect the problem of the housing of the working classes.

HOW WE SUFFER UNDER THE SUGAR CONVENTION

AN EXAMPLE OF FOOLISH LEGISLATION—HOW BRITISH INTERESTS HAVE BEEN DAMAGED, TWELVE THOUSAND MEN THROWN OUT OF WORK, AND THE PRICE OF SUGAR TO THE HOUSEHOLDER DOUBLED

BY

H. E. KEARLEY, J.P., D.L., M.P.

AT the time when the Government first intimated, in the King's Speech of 1902, that an International Conference on Sugar Bounties had recently assembled at Brussels, the " raging and tearing propaganda " of fiscal reform was not yet revealed as a policy, though no doubt it was in process of incubation.

According to the Speech, the Conference was to lead " to the abandonment of a system by which the sugar-producing colonies and the home manufacturers of sugar had been unfairly weighted in the prosecution of this most important industry." Had the proposal followed instead of preceding the fiscal agitation, who can doubt but that the country would have been spared from this act of folly.

Three years have now elapsed since the

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House of Commons, induced by the representations of the Government, sanctioned the signing of the Convention committing this country to its policy; meanwhile, sufficient has happened to enable these to be considered anew in the light of cold facts.

Only through the abolition of the bounties, the Government told us, could the industries of the British refiner and West Indian planter survive; and were it not that British interests were involved, they said, they would not lift a hand to assist Continental bounty-giving countries in relieving themselves of a burden they already found intolerable.

Among the most pregnant evils ascribed to bounties were that they stimulated the overproduction of beet sugar in Europe, causing it to be sold in our market at many pounds per ton below the cost of production, to the serious injury of the English refiner, and so injuriously affecting the value of cane sugar that not only were the West Indian planters being ruined, but the growing of cane the world over was rendered so unprofitable that it was ceasing to be cultivated. The prevailing cheapness of sugar here was declared to be unnatural and bound to be dearly bought later; for, said the Government, Germany and Austria, by the continuous augmentation of their bounties, were working to a policy of extinction of all European competitors, so as to secure to themselves a monopoly of the supply of beet, and meanwhile cane sugar having "gone," they would soon gain complete control of our market and would then proceed to exploit us at their leisure.

With the bounties swept away, a bright and happy future was to be assured to all. The decline in the growth of cane would cease, and its area of cultivation be enormously extended, and thus avert the danger of dependence on beet as our sole source of supply. The West Indies alone, according to Mr. Chamberlain, when given a fair chance, would produce us 2,000,000 tons per year! The violent fluctuations in prices during the past twenty years were also attributed to the bounties. There was to be an end to all these, and instead we were to have a "natural and normal" price in the future, so accurately worked out by the Government that we were confidently assured that the average price of sugar for the next ten years would not exceed 10*s*. per hundredweight, and would probably be considerably less.

How fantastic their case appears when we apply to its examination the logic of facts. The alleged decay of the British refining industry is best answered by a reference to the prospectus, issued some two years since, of Messrs. Tate & Son, in which they stated that "*they had competed successfully with all makes of refined sugar, both British and foreign, notwithstanding the advantage possessed by the latter in the bounties given by the Governments of the countries of their production*," and that the business ever since its formation in the year 1859 had been eminently successful, confirmatory proof of which was disclosed in their annual profits, which, strange to relate, showed in the year when beet sugar reached its then lowest point, and according to the Government its deadliest point for the British refiner, a comfortable profit of £215,000. It is quite true that thirty years ago there were scattered over the country a miscellaneous assortment of a score or more refiners, mainly of German extraction, whose ultimate extinction was not attributable to the bounties, but to the keen competition of their British rivals, Messrs. Tate and Lyle, who alone, equipped with up-to-date methods, are producing to-day more than double the output of all those they have superseded. A case of the survival of the fittest!

As regards the West Indies, the main cause of their decline is economic, for they have had to contend not only with the scientific manufacture and cultivation of the Continent, but with cane-producing competitors such as Java and Cuba, where the process of cultivation and manufacture has been brought to such a wonderful pitch of perfection that fine sugar is produced at 6*s*. per hundredweight. Thanks to the old protection which the West Indies formerly enjoyed from the Mother Country, the estates were so profitable that they were divided and sub-divided too minutely to be able to bear, when bad times came, the expense of proper machinery. They have immense natural advantages over beet, inasmuch as although the weight of sugar extracted from a ton of beet is more than the weight extracted from a ton of cane, yet the tonnage of cane grown on an acre of ground is at least double the tonnage of beetroots on the same area. But almost three-fourths of the sugar crop of the West Indian Islands proper is still made on the old and wasteful open-pan process, which involves the loss of a large percentage of the saccharine in the cane. The real remedy here is not the Convention policy, but the separation of cultivation from manufacture, and the erection of central factories where sugar can

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be made on a large scale and on a modern system.

A study of the annual beet crops of the various countries of Europe disposes of the German and Austrian bogey of ultimate monopoly. As a matter of fact, Russia, one of the countries whose supplies are excluded from us by the Convention, is and has been for many years the second largest producer in Europe; and France, almost as large a producer, has more than doubled its output between the years 1894 and 1902, the Convention year. Further, in refutation of the statement that to bounties were to be attributed the over-production and consequent depreciation of the price of beet sugar on the Continent, let me point out that prior to the year 1900 the average bounties for the thirty years preceding this date did not exceed 1*s.* 3*d.* per hundredweight, whereas the fall in price has been far in excess, due in reality to improved cultivation and scientific methods of saccharine extraction.

Now as to their effect on the growth of cane throughout the world. Was the bounty system killing cane production? Here again figures and facts are too strong for such a fanciful hypothesis. The prevailing idea at the time of the Convention, and one fostered by the arguments of the Government, was that the production of cane sugar the world over was dwindling. But what are the real facts? The production of cane sugar during the last twenty years has more than doubled (the total crop in 1882–1883 was 2,200,000 tons, and in 1904–1905, 4,584,000 tons estimated), and in the last five years it has increased by nearly a million tons (1900–1901, 3,657,000 tons). And if we take individual cane-producing countries, less advantageously circumstanced than the West Indies, we find the same continuous augmentation. For instance, Java shows an increase of over 100 per cent. during the last ten years (1894, 531,000 tons, and 1904, 1,086,000 tons); and Cuba has increased from 630,000 tons in 1900–1901 to 1,200,000 in 1904–1905. The case of the Government was that the Convention would extend the area of production. They now claim that the Convention has had the effect of increasing the cane crop by 400,000 tons. Not one single ton of this increase can be attributed to the action of the Convention. It has taken place in countries in which the Convention has had no more effect than it had upon the recent lunar eclipse, in countries under American influence, where American sugar is mainly consumed. The argument of the Government all through has been that the Convention would benefit the West Indies. How much have the West Indies contributed to the increased cane production? Not a single pound. As a matter of fact, since the Convention came into force the production of the West Indies has declined and is continuing to decline. Those countries which produced the increased cane crops have, as I have already stated, America for their market. The Philippine production has increased by 40,000 tons, Louisiana by 124,000 tons, Puerto Rico by 25,000 tons, and Cuba by 160,000 tons. Not one of these was a country for which the Government legislated. The Government legislated for the West Indies, and in these alone of all the cane-producing countries of the world has there been a decline. In 1904 the West Indies were estimated to produce 221,000 tons, whereas in 1903 they produced 249,000 tons; in 1902, 239,000 tons; and in 1901, 258,000 tons.

Let us now take stock of the actualities for which the Convention is the sponsor.

The total rise in the price of 88 per cent. beet, the standard of all sugar prices, since March 1902, the date of the signing of the Convention, is over 150 per cent., namely, 6*s.* 8*d.* to 16*s.* 3*d.* The price to the consumer has doubled, and the Government say it is all owing to the drought of last autumn, which caused a deficit in the beet crop of 1,100,000 tons. Unfortunately for the argument, the rise has been practically continuous since this ill-starred policy became assured, for within a year of the signing prices had risen 40 per cent. from the lowest point, and by May 1904 the enhancement amounted to 60 per cent. All this happened before there was even a whisper of any shortage in the crop; indeed, the advance took place in face of a visible supply of excess stocks of 2,500,000 tons. Three years previously, when there was the same amount of visible supplies, and no Convention, the price of sugar fell to the lowest point on record (5*s.* 11*d.*).

In addition to making domestic sugar dearer to the British consumer, the Convention has brought about a great advance in the price of the raw material of our sugar-using industries, and whilst accomplishing all this it has actually, by relieving the foreign consumers of financial burdens and grasping trusts, cheapened the price of sugar there to our own detriment.

The deficit in the beet crop, as already stated, was 1,100,000 tons, but at the same time there was an increase in cane of 400,000 tons, so the actual deficit was only 700,000 tons. This would occasion a rise of 1*s.* or 2*s.* at any time,

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but the Convention was solely responsible for two things, which immensely aggravated the situation. Thanks to the Convention, the consumption of sugar on the Continent last year increased by 840,000 tons, which under previous conditions would have been available for export. Secondly, it has cut us off from all supplies from Russia and Argentina, whose crops exceed a million tons. So to the actual deficit there has to be added the moral and material effect, from a market point of view, of practically 2,000,000 tons being no longer available or visible for the United Kingdom. If the Convention has its way, it will soon have closed to us every source of supply save those under its control, for only the other day it ruled out seventeen other countries, whose crop, in addition to those already excluded, exceeded 500,000 tons. Every step the Convention has taken has been in the direction of shutting out supplies from this country, and it is becoming abundantly clear that its object is to make sugar dearer here; and no wonder, when we consider that every nation represented, save England, is a sugar producer and covets our trade.

These are the circumstances beyond question that have forced the market to its present high point. The helplessness of our position has been used by Continental speculators as a gambling counter. They saw their opportunity and manipulated a highly profitable boom in sugar at our expense, and the whole of the speculation which enhanced the price so unduly must be laid at the door of those who have fettered us to the policy.

The effect of the Convention on British sugar-using industries has been disastrous. The number of men employed has decreased by 12,000, and during the Christmas season, when these industries should have been most actively engaged, 50,000 men were working short time. Formerly our confectionery, biscuit, jam, chocolate, cocoa, and other kindred trades were supreme, not only in neutral but also in the protected markets, but now they are being excluded and beaten in competition, because the sugar-producing countries, thanks to our cosmopolitan benevolence in giving them cheap sugar, are not only manufacturing for themselves but invading our markets at home and abroad.

Bounties may be evil things, especially to those countries who give them, but to deliberately submit the consumers and sugar-using industries of this country to a tax of some millions sterling a year in order to put money into the pockets of the West Indian planters and a few sugar refiners in the United Kingdom, is not only rank Protection, but egregious folly. By the Convention we have destroyed the independence of our commerce, which hitherto has enjoyed open ports, unrestricted markets, and the privilege of buying in the cheapest and selling in the dearest, and have handed over the control and direction of a great trade to a foreign syndicate of sugar-producers in which our voice counts but as one in ten.

Finally, in view of what we now know, we are entitled to believe that it was intended to be the first instalment of the greater Protectionist revival, of which the country has heard so much, and about which it has formed such a decided view. But be this as it may, all the sanguine predictions of the Government have been falsified. The price of sugar to the British consumer has doubled. Our manufacturers have suffered severe losses. Employment has diminished. Fluctuations in prices have been greater since the Convention than for any period during the past fifteen years, and instead of a "*natural and normal*" price of 10*s*. per hundredweight, it has more nearly approximated 20*s*. The production of sugar in the West Indies has declined rather than increased. But there is indeed one great compensation, for we have the word of the Prime Minister that for the first time in our commercial history we are enjoying under the Convention real Free Trade!

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THE MARCH OF EVENTS

AN UNPRECEDENTED CLOSURE OF DEBATE—THE PRIME MINISTER AND THE HOUSE OF COMMONS—A LITTLE LECTURE FROM THE "TIMES"—THE ARMY SCANDALS IN SOUTH AFRICA—THE RUSSIAN RUIN

BY

HENRY NORMAN, M.P.

THE clearly inevitable has duly happened in Parliament. The Prime Minister has been compelled to introduce a long and elaborate series of Closure resolutions effectually gagging debate till March 31, in order to get his Army Estimates through the House of Commons—resolutions which he himself admits to be entirely without precedent. The effect of them will be to limit effective debate upon the Army Estimates in all stages to nine hours, and meanwhile to prevent the Opposition from raising in the customary manner any outside question, however urgent or important, by such motions as to report progress or for the adjournment of the House. It is quite true that he is compelled to do this: the reason of the compulsion is also clear. Never in modern Parliamentary history has a Prime Minister so neglected his duties in the House. It is no exaggeration to say that Mr. Balfour is seldom present. He is there to answer questions, and he duly appears a short time before he has to speak. Otherwise, Ministers, even the youngest, are left unsupported and unguided, and therefore the debates drag loquaciously on. It has always been the pride of great Parliamentarians to get important measures through the House of Commons without the use of the closure. Sir Henry Fowler so got his Parish Councils Bill through the House; Sir William Harcourt so passed his almost revolutionary budget involving the Death Duties; Sir Michael Hicks-Beach so secured one of his most difficult budgets. Mr. Balfour can do nothing without the use of the gag. Moreover, the House did not meet till February 14—a fortnight late. Finally, owing to the inability of the Government to get their supporters to attend, they have frequently been compelled to put up obedient and thick-skinned Government speakers to talk against time until the Whips were sure there was a majority present. Under such conditions legislation is obviously impossible without closure. It is destructive to national efficiency—£116,000,000 has been voted in four years without discussion; it is degrading to Parliament; it annihilates interest and opportunity on the part of private Members: and it is a discredit to the Minister who is responsible for it. If any reader thinks these are partisan criticisms, I refer him to the following comments of the *Times*, which, as everybody knows, is a thick and thin supporter of the Government. When the Resolutions were introduced by Mr. Balfour, the *Times* said:

"The motion, as he frankly admitted, is absolutely without precedent, and it unquestionably encroaches upon the traditional privileges of the House. All legislatures are naturally jealous of measures of that kind, and this feeling may be expected to be strongest in the ranks of the Conservatives. . . . Mr. Balfour, as Mr. Lloyd-George said in his humorous speech, has the habit of blundering into an awkward position and then calling it a Parliamentary emergency. There is an element of truth in the charge. The Prime Minister is so much occupied with other duties—inevitably, perhaps—that the House often finds itself practically without leadership. A good deal of time is wasted in this way, and then more time is wasted in discussing extraordinary remedies to provide against the consequences of the waste."

After they were voted, the *Times* treated Mr. Balfour to this remarkable little lecture:

"Mr. Balfour may be congratulated on achieving his object with very little difficulty, though we hope he will remember that, the more time he can spare for personal direction of Parliamentary business, the less need will there be for proposing extraordinary measures to cover emergencies."

When the most influential newspaper in the country and the principal supporter of the Government feels it a duty thus to remind the Prime Minister that he is neglecting the ordinary duties of his office, a Liberal may surely be pardoned for the same observation.

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The importance of this question of Army Estimates lies in two facts: first, it is common knowledge that the War Office is in a state of chaos unexampled even in its chaotic history. Mr. Arnold-Forster's scheme is wholly repudiated by the Cabinet, and he himself is in such a position of political isolation that his resignation or transfer to another office is commonly expected; and, secondly, that instead of the economies which he promised last year, there is a serious increase of expenditure. Last year he said that "so entirely did he share the view for the urgent need of economy that certainly he should not be responsible for making any proposal to the House for the reorganisation of the Army which would not convey the promise of a very substantial reduction upon Army Estimates." Now the Army Estimates show an increase of nearly a million sterling!

In another matter connected with the Army the action of the Government—all party criticism aside—passes comprehension. The Comptroller and Auditor-General of the Army, of course an independent and non-party official, has recently published his Annual Report revealing a series of the gravest possible scandals. For instance, a thousand mules landed in South Africa remained entirely unaccounted for; 1,350,000 lbs. of jam were found to weigh 12 ozs. to the lb.; very large quantities of oats was bought from an Army contractor at 17*s.* 10*d.* per hundred pounds, while oats were sold to him by the Army representatives at the same time for 11*s.* per hundred pounds; forage was sold to a contractor "to enable him to carry out his contract." At least a score of times he had asked the War Office months before for explanations and vouchers, and no answer whatever had been received. Nobody will suppose that the Government is more anxious than the rest of us to hide corruption or shield dishonest men, yet the fact remains that only after persistent badgering of Mr. Arnold-Forster by repeated questions and supplementary questions, pressed to the very limit of the Speaker's tolerance, has it been possible to get from him—and not altogether yet—the facts about these scandals, or the names of the contractors concerned. It is impossible to conceive why the Government should have adopted this attitude.

* * * * *

The case of Sir Antony McDonnell, to which I called my readers' attention last month, has occupied a good deal of attention, but the last has not yet been heard of it. The publication, after great pressure from the Liberal benches, of the correspondence between Mr. Wyndham and Sir Antony showed that the latter was absolutely justified in the course he took. Moreover, it has become clear that Lord Dudley, the Lord-Lieutenant, was aware of what was going on, that Mr. Wyndham was aware of it up to almost the last moment, and that the terms of Sir Antony's position were submitted to Mr. Balfour and approved by him. Now, after a fortnight of hesitation, Mr. Wyndham resigned his office, or was squeezed out, and much sympathy has been expressed for this unfortunate close of the political career of a very ambitious and unusually gifted man. But the universal opinion has been that if Mr. Wyndham had acted so wrongly that his resignation was imperative, then common courage and loyalty required the Prime Minister to resign with him. Mr. Balfour's position has simply been that, if the new departure in Ireland had been a success, he would have taken the credit of it; but as, owing to the action of the Ulster Members, it proved a political failure, he sacrificed his subordinate and saved himself. I draw my readers' special attention, however, to the fact that Lord Dudley has not yet been heard from.

* * * * *

The fiscal event of the month has been the resolution which Mr. Winston Churchill was lucky enough to get by the ballot, to the effect that the permanent unity of the Empire could not be secured by preferential trade with the Colonies involving protective duties on food. For days there was complete uncertainty in the Ministerial camp as to how this square issue could be successfully avoided. To have left it open to Members of the House of Commons would, of course, have resulted in the passage of the resolution by probably 550 votes to 50. On the other hand, if the Government met it by a frank negative, Mr. Balfour would have been in the position of having, to some extent, made his attitude upon the fiscal question clear at last by avowing himself on the side of the protective taxation of food for preferential purposes. Therefore the issue had to be dodged, and it was dodged in a way equally humiliating and effective, namely, by moving the "previous question," the object of which, according to the standard authority upon Parliamentary procedure, is to prevent the House of Commons being called upon to express an opinion upon an issue improperly raised. It is put from the Chair in these words: "The question is that the question be not now put." Mr. Balfour sailed away

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by now insisting that this matter should be left for the Colonial Conference which, when he was asked for it by Mr. Chamberlain last session, he declared his intention of not calling. Mr. Asquith, to whom the House of Commons now regularly looks for the most vigorous assertion of the Liberal attitude, pointed out that the House was hearing a great deal about a free and unfettered Colonial Conference, but might at least have an example set it by the Government allowing a free and unfettered House of Commons, for once at any rate, to pronounce its opinion on that which is the dominant and capital issue in the politics of the day. But the most remarkable feature of the debate after all was contributed by Mr. Chamberlain. Recently he delivered himself of this unimpeachable truth: "Victories in politics are like victories in war—they are won by enthusiasm, they are lost by timidity." The man who uttered these words, who has roused the whole country to a pitch of excitement and unrest over the fiscal question, who has declared that our trades are being ruined and our Empire in danger, that the Colonies have made us an offer which if not grasped will pass for ever, and that it is only the timidity of his followers in hesitating to declare themselves for his whole programme that has lost them the by-elections—this man speaks and votes in favour of a motion "that the question be not now put"! Comment is unnecessary. Mr. Chamberlain obviously admits what everybody else knows to be the fact, namely, that his cause is lost. And in his own phrase, he is taking his defeat "lying down." There is but one course left for him; immediately after the Budget to force Mr. Balfour to dissolve Parliament, and thus to get his inevitable defeat over and trust to the future to better his position. This is the course he will probably take.

* * * * *

General Kuropatkin has been peremptorily deprived of his command, and has left the front for St. Petersburg, not one word of acknowledgment of his past services accompanying his dismissal. This fact sums up the situation in the Far East. The great army of Manchuria has been utterly routed, with an awful total of killed and wounded, and the loss of vast quantities of *matériel* and stores. Mukden and Tieh-ling are taken, and what remains of the Russian army is in retreat upon Harbin, which is a very long way off and which it may never reach. A Japanese force is marching upon Vladivostok. Admiral Rozhdjestvensky has disappeared. It is defeat, total and—so far as one can see—irretrievable. Will there therefore be peace? That obvious question nobody can answer. It is reported that another Russian army of 400,000 men is to be raised and despatched. On the other hand, it is asserted, with every show of reason, that the internal state of Russia renders it impossible to mobilise such a force and to denude European Russia of its remaining trained troops. Prince Mestchertsky, the editor of the *Grashdanin*, and one of the stoutest upholders of autocracy and what we call reaction, writes as follows:

> Russia must choose between a continuation of the war without hope of success, and with the certainty of internal shipwreck, and its termination followed by the salvation of the country through its renovation. Let us have the heroic strength to confess defeat before the world.

It is not surprising that such sentiments, from such a quarter, should have caused a "great sensation." The "certainty of internal shipwreck"—that is the dreadful kernel of the utterance. I, as my readers know, have held as long as possible to the belief I formed in St. Petersburg, that the Tsar had both the will and the power to do the best for his people. I can no longer think that he has both these. A golden opportunity presented itself and was allowed to pass. If the Tsar, two or three months ago, had declared to his people that in this gravest crisis of Russian history he needed their advice and their support, and that therefore he summoned the old constitutional National Assembly, adjuring them to join with him in deciding what was best to do, and in carrying it out against all obstacles, he would have been to-day the most powerful and the best-loved ruler Russia has ever known, and the Russian people would have been united in one common determination, whether for peace or war. That opportunity has been lost—with the result we see. That it will ever recur is improbable. Those of us who hoped to see, under the Tsar's wise guidance, a Russia emerging from the war, even though defeated, not humiliated, and her people all working together for her welfare in peace, industry, and public honesty, can but admit our deep disappointment and sorrow. Her future is black indeed, but what hard paths she may yet be called upon to tread before reaching the inevitable era of constitutional reform and popular freedom, few of us—and certainly not I—have either the courage or the desire to attempt to forecast.

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A MODERN ALCHEMIST: ERNEST SOLVAY

INVENTOR AND MILLIONAIRE—THE SOLVAY PROCESS OF MAKING SODA—THE STORY OF ERNEST SOLVAY'S CAREER AND ITS FAR-REACHING EFFECTS UPON INDUSTRY

BY

ALDER ANDERSON

WEALTH is acquired by various means, some creditable, others the reverse. Very often, the community is impoverished for the benefit of the individual. In rarer cases, the individual enriches the whole community while enriching himself, and may then fairly be termed a public benefactor. Such a man is Ernest Solvay, the subject of the present sketch.

The reader may be what is vaguely described as a very well educated man, and yet not have heard of the "Solvay process;" there is, however, hardly anything that should more directly interest him. It is to it that he is principally indebted for the cheapening of half the commodities of his daily life—not excepting his halfpenny morning paper—and, very possibly, if he is a working man, for his actual means of livelihood. The Solvay Process, is, in fact, one of the indispensable pivots in the complex mechanism of modern civilisation.

In a memorable postprandial speech, a few years ago, a British statesman confidently asserted that a great trade revival was imminent, a prophecy, which he said, he based on the fact that the chemical industry showed signs of renewed prosperity. A large proportion of his auditors were visibly nonplussed and then, imagining, doubtless, that the statement concealed some mordant satire, too recondite for the comprehension of ordinary brains, politely and tentatively tittered.

And yet, though he could not claim the merit of originality for his observations, the Prime Minister of Great Britain had, in those few words, placed his finger with unerring precision on the very keynote of the age. To-day, chemistry dominates the world to an extent that the majority of Englishmen, unfortunately for themselves, have not yet sufficiently realised. One humble product of the laboratory, notably—carbonate of soda—occupies so preponderant a place that, were the supply, from any cause or combination of causes, suddenly to fail, the whole intricate organisation of our daily existence would be jeopardised. Scores of the principal industries of the world, the manufactures of glass, soap, and paper, to name three only—would be gravely imperilled, and it is no exaggeration to say that there is hardly one industry that would not suffer more or less, directly or indirectly. Unromantic and extraordinary as the assertion may sound to some ears, the consumption of soda is one of the simplest tests by which the prosperity of any modern people can be most accurately gauged.

Fifty years ago the total annual production of the world amounted to only 150,000 tons; at present it is, in round numbers, 2,000,000 tons, and is constantly increasing. But this is not all. The price, which, at the beginning of last century, was sometimes nearly £100 a ton, and, in 1850, was about £30, is now under £4. For bringing about these prodigious results, one man is almost entirely responsible, Ernest Solvay, a name which posterity will probably revere as one of the greatest benefactors of his age. It has been calculated indeed, that by his inventions, Ernest Solvay has already increased the general prosperity and well-being of his fellowmen to an extent that would probably be underestimated at ten millions of pounds sterling annually!

The career of this prince of latter-day alchemists is one of those fairy tales that owe their possibility to the working compact entered into at last between science and industry, and is thoroughly typical of the new economical *régime* that dawned towards the middle of last century.

Solvay's father was a salt refiner, his uncle the manager of some gas-works in one of the

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suburbs of Brussels. Influenced no doubt by his early associations, it seemed to him, ever since he was able to reason, that the only men of real merit and utility in the world were those who *produced* something that added to the comfort or well-being of society in general. No other career tempted him.

At the age of twenty, he became his uncle's assistant at the gas-works. This was in 1859. The dazzling prospects opened up by the new theories of chemical synthesis, and their practical applications, fascinated him, and he determined to put them to practical test without delay.

The first task that engaged his attention in his new post at the gas-works was that of devising some scheme for utilising the ammonia-charged water that was suffered to run to waste. His early years, as has just been said, had been spent in an atmosphere impregnated with salt, one of the most ubiquitous and abundant of nature's products. What more natural than that he should have the idea of trying what a combination of the two humble outcasts would lead to? He made the experiment and obtained carbonate of soda. In that instant his mind's eye pierced far into the future, and he had a clear perception of all that such a discovery implied. A more economical method of producing soda than that which went under the name of Leblanc, and was then universally practised, would completely revolutionise the industrial world. Such a method was now actually in his hands!

The idea that he was not the first discoverer never crossed his mind. Without delay, therefore, he took out a Belgian patent for the process, and set up a small experimental manufactory. The result was satisfactory, and his next step was to offer his invention on mutual terms to the leading Belgian manufacturers of chemicals. Nobody would listen to his proposals. Undaunted by these checks, he sought legal advice as to the most practical method of utilising and protecting his invention. None but the best advice would serve him, and it was to M. Pirmez, then at the head of the legal profession in Belgium, and a financier as well as a lawyer, that he applied. His choice was a fortunate one. The lawyer was immediately won over by the glowing enthusiasm of his young client, and by the end of their first interview was persuaded that the invention was one of enormous importance. M. Pirmez was himself no chemist, however, and he suggested that, as a precautionary measure, it might be as well to make researches in the proper quarters with the view of finding out whether there was anybody else in the field who could claim priority of discovery.

A terrible blow was in store for the young enthusiast! So far he had jealously guarded his secret for himself. What, then, was now his dismay to find out that his wonderful invention had been public property for more than half a century! And this was not the worst of the matter. Both in England and in France large sums of money had been expended in vain attempts to turn the invention to industrial account.

Eminent living chemists whom he next consulted pooh-poohed his ideas, and proved to him conclusively, at any rate to their own satisfaction, that all such attempts were inevitably foredoomed to failure. Now, indeed, he felt his hopes beginning to waver, and yet—yet—he was only twenty-two, and youth is ever confident in itself!

It was a very mournful tale, however, he had to tell M. Pirmez at their next interview.

The lawyer listened attentively. "What are the names of the persons who have tried and failed?" he asked.

The young man repeated the list which he knew by heart. "Thorn, Muspratt, Young, Deacon, Canning, Waterton, Brooker, and Gossage in England; Schloesing and Rolland in France." Not a name among them that did not stand for that of a man universally known in the industrial world as a fountain of common sense and business acumen. By the time he had finished the mournful enumeration, the speaker felt that his doom was sealed. M. Pirmez would assuredly wish to wash his hands of the whole business. But again the young man was destined to receive a surprise, though this time it was an agreeable surprise.

"If men such as those whose names you have given me have really devoted their means and time to this question there can assuredly be nothing chimerical about it; the idea must be sound at bottom. We must see this business through."

Thus, strangely enough, it was the financier on whom now devolved the task of reanimating the inventor's courage, an inversion of roles which, it will be allowed, is not common. M. Solvay himself is never tired of citing the circumstance as an encouragement to inventors on no account to abandon any idea of the soundness of which they have once been persuaded.

In 1863, a small capital of between £5000 and £6000 having been privately subscribed,

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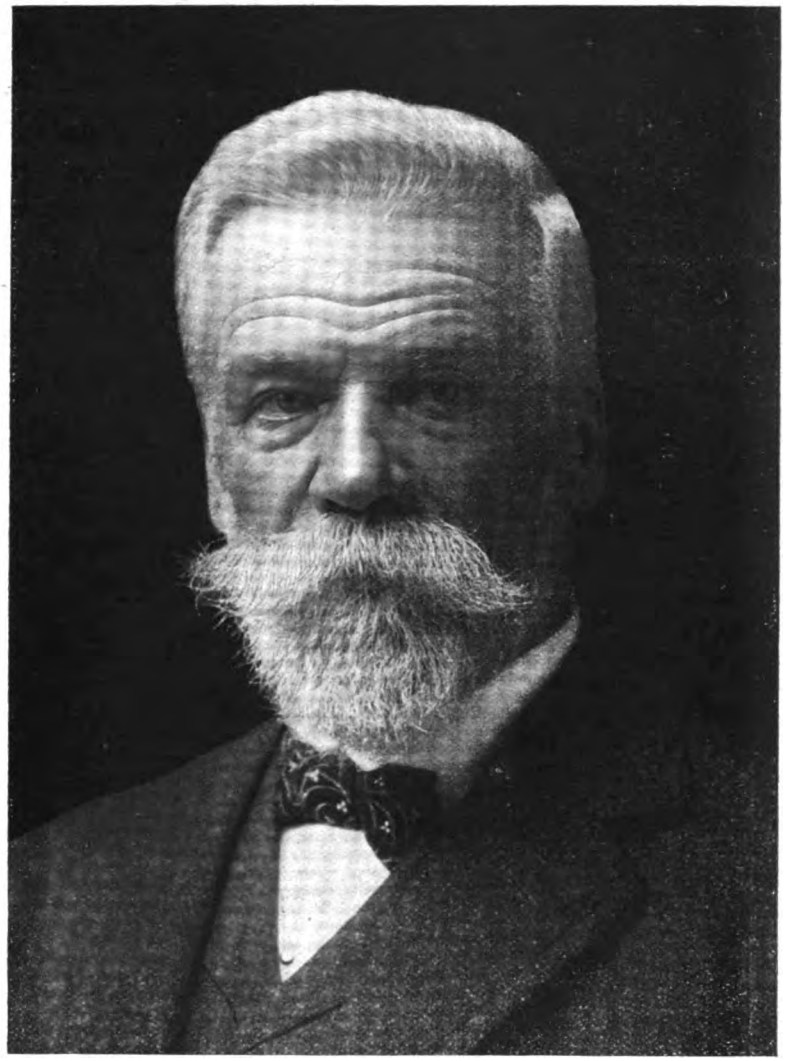
the firm of Solvay and Co. was founded. For two years the result trembled in the balance. The original capital was exhausted and more had to be found. Many a sleepless night was passed by the young chemist and his brother Alfred, by whom he had been joined, in devising means of perfecting their apparatus, and so passing the narrow boundary line that often separates success from failure. At last the goal was attained; the new product was manufactured at a price which enabled it to compete with its old-established rivals, and in 1867 a dividend of 5 per cent. was distributed to the shareholders.

Five years later, in 1872, M. Solvay had his first real taste of the sweets of success. He received a visit from a German manufacturer of chemicals, established in England, the now famous Dr. Ludwig Mond. As a result of the interview between the two men, it was settled that Dr. Mond should abandon the enterprise connected with the Leblanc method of soda production, in which he was then engaged—namely, the recovery of sulphur from alkali waste — and introduce the rival Solvay process into England in conjunction with his friend Mr. (now Sir John) Brunner. The importance of the great establishment thus founded at Northwich, in Cheshire, is too well known to be insisted upon. Very soon similar manufactories were formed at a score of different places in Europe and America, and to-day, Ernest Solvay and those associated with him produce practically all the soda consumed in the world, the amount made by the other system having dwindled to quite insignificant proportions.



M. ERNEST SOLVAY

A photograph specially taken for THE WORLD'S WORK AND PLAY

M. Solvay has long been one of the richest men in Belgium, but, in his case, one quite overlooks this fact, in view of the interest aroused by his personality. The acquisition of wealth with him has been ever a secondary object, an accessory, as it were, rather than an end in itself. At heart, he is first and foremost a man of science; by his own original researches he has always kept in the very vanguard of contemporary thought, and with princely generosity he has founded and endowed in one of the public parks of Brussels three scientific institutes, representative of what he believes to be the three principal wants of the age: an Institute of Physiology, an Institute of Sociology, and an Institute of Commerce. Such a scheme is eminently characteristic of the man.

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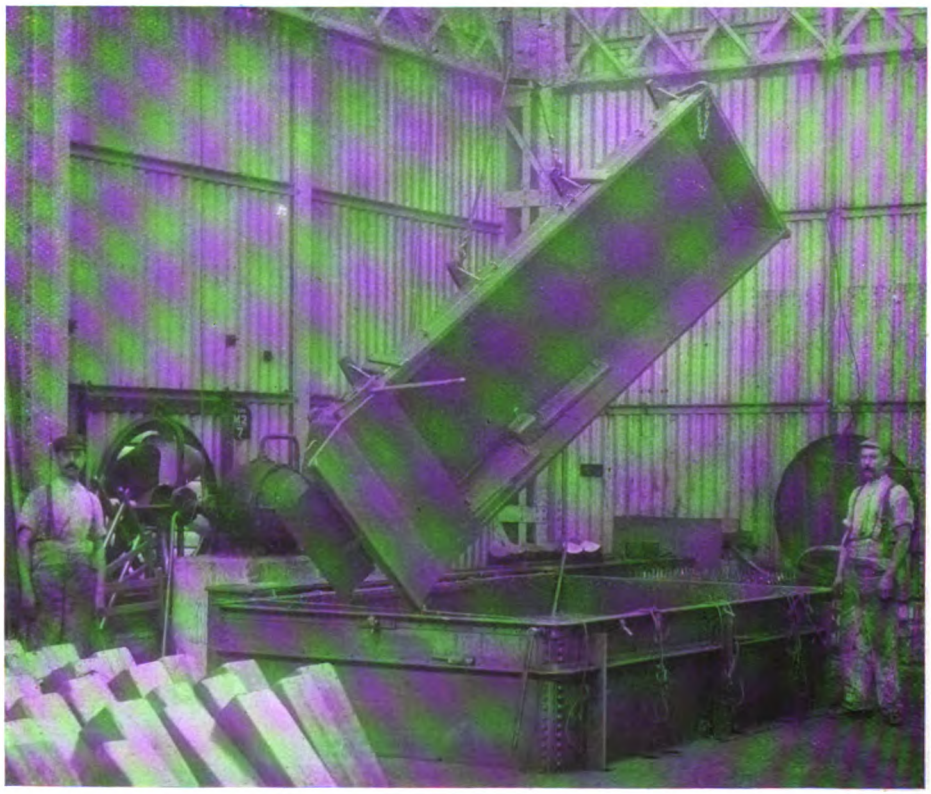
THE DIPPING PROCESS OF PAINTING

A GREAT TIME SAVER—HOW A WAGGON IS PAINTED AND DRIED IN FOUR HOURS —THE WOOLWICH TANKS DESCRIBED AND ILLUSTRATED

THERE has recently been completed at the Royal Carriage Department of the Royal Arsenal, Woolwich, an extensive plant by which artillery, ammunition, and other waggons, as well as many other articles used for military purposes, are painted by the simple process of dipping them into a tank containing specially prepared paint. The system might be applied to many forms of vehicles and appliances that require to be painted from time to time, such as waggons, dust carts, barrows, and an infinite variety of other articles of the kind. Though the replacing of skilled hand labour, by machine work in conjunction with unskilled labour, is always a painful process for the hand-worker until another sphere for his activities is found, it seems fairly evident that the saving to be effected by the new system will prove of great interest to manufacturers and public bodies.

Paint-dipping plants are common in America, but as far as the writer can learn there are only three in active operation in this country, the largest being that at Woolwich Arsenal now under consideration. Obviously the paint used must be different from that employed when it is intended to apply it by means of a brush. For it must dry quickly, and also it must be in such a liquid state that it will reach every part of the article which is dipped into it. To ensure this, benzine or naphtha is used instead of turpentine, while special driers are added which cause the paint to dry in four hours. To prevent the heavier part of the paint settling, agitators or propellers are fitted at the bottom of the tank, and these are kept continuously in motion by means of an electric motor; the paint is always stirred up, so to speak, and is of a uniform consistency. The colour used at the Woolwich Arsenal is karki, but there is no reason why other colours should not be employed—in agricultural implements, for example,



DIPPING A CART IN THE TANK OF PAINT

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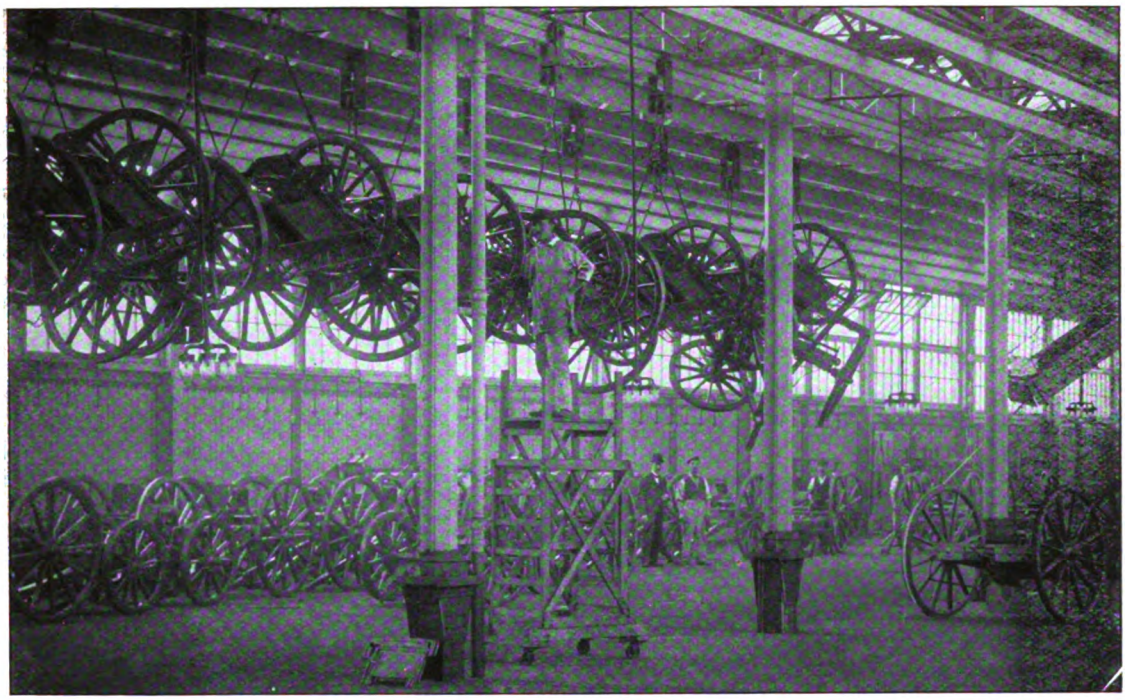

PAINTED WAGGONS HANGING UP TO DRY

red is used. The paint is not very glossy, as it is not desirable, for obvious reasons, that the guns and gun carriages should reflect the light.

The building devoted to the painting-plant is of considerable extent, measuring about 100 yards long. Four travelling cranes actuated by electricity cover the open space around the tanks, and it is a very simple and expeditious matter to take up a waggon, through which has been passed a sling, carry it to the end of the room where the tank is located, attach lead weights to make it sink, and dip it into the tank. Then the waggon is immediately lifted, allowed to drip for three or four minutes, and then literally hung up to dry. There are wrought-iron girders running from end to end of the building, and as the articles are dipped they are hung on to the girder by means of their slings, which are held on jennies having rollers, and they are thus easily moved down to the other end of the room, where a second tank is situated. They there receive the second coat, after which they are returned to a third tank to receive the third coat.

As the composition of the paint in the three tanks is exactly the same, it would be quite possible to dispense with one or even two of them. But by providing as many tanks as there are numbers of coats of paint to be applied the work is greatly facilitated, for the waggons are moved gradually from one tank to another, without any great labour, and dry during that interval, so that by the time each article reaches the second and third tank it is ready to receive the second or third coat as the case may be.

The tanks measure about 12 ft. by 8 ft. and hold about thirty tons of paint. They are built partly underground, and the dimensions are sufficient to accommodate any article likely to come to the painting-shop. There is nothing in their construction which needs special explanation, except a fan, placed at the side, and communicating with the outer air, which is used to draw off the benzine fumes when necessary; and one other provision for preventing the pigment in the paint settling during the night, when the agitators are at rest, and clogging them. This is done by providing a temporary floor of steel, formed of slats or strips like a venetian blind. When the agitators are at work, these iron strips are vertical, leaving spaces between them; and when at rest, a lever brings them to a horizontal position, lapping one another, thus forming a temporary floor upon which the pigment rests. The success thus far made at Woolwich leads one to expect that similar, if smaller plants, will soon be erected in various parts of the country.

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CAN THE TOWNSMAN FARM?

II.—THE COUNSEL OF EMINENT AUTHORITIES*

HEADS OF LEADING AGRICULTURAL COLLEGES ON TRAINING ON FARMS AND TRAINING AT THE COLLEGES—DEFINITE ADVICE TO PARENTS AND TOWNSMEN WHO WOULD TURN COUNTRYMEN — THE FINANCIAL OUTLOOK FOR THE TRAINED TOWNSMAN—INTERVIEW WITH THE PRINCIPAL OF WYE

BY

"HOME COUNTIES"

THE question has been discussed whether it is better to learn farming at a College or a farmer's. Such a problem could only present itself to people who know nothing about farming. No one can learn farming at a College only.

A training at a College and a farm training before or after is another matter.

The speech once addressed to Principal Dunstan by a farmer who wanted to send his son to Wye shows what it is the Agricultural Colleges do for their students. When asked what made him wish to have his boy come to College the farmer said he wanted him to learn what he (the farmer) did not know and could not teach him. As the Head of another Agricultural College said to me, "This practical man knew what he was talking about." In a sentence, what the Agricultural College offers is what all farmers advertising for pupils are not competent to teach, and, as one of their critics once remarked in my hearing, "don't pretend to teach if they are honest."

A Scots Agricultural Professor has recommended the plan of a would-be College student first putting in a few years at practical work on a farm. (Note that, as Professor Robert Wallace points out, "practical work may be brain work as well as manual work.") And undoubtedly there is a great deal to be said for this method. It knocks some of the conceit out of the youngster. It opens out before his eyes the depths of his own ignorance. It also gives him a lot of useful practical information. Finally, it enables him to make the best use, when he gets to College, of the means of learning which it offers.

On the other hand, one has heard it argued more than once, the young man who is desirous of learning, and comes to College at a receptive period of his life, is likely to save himself the learning of some things which have to be unlearned if success is to follow his

PROF. R. PATRICK WRIGHT, F.H.A.S., F.R.S.E.
Principal of the West of Scotland Agricultural College
(From the "Scottish Field")

* See also "Home Counties'" article in THE WORLD'S WORK AND PLAY for March, "Can the Townsman Farm? I—An Account of the Training Given at an Agricultural College."

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MR. P. HEDWORTH FOULKES, B.Sc.
Principal of the Harper-Adams Agricultural College

farming. But even if this be so—I doubt it—he must be really desirous of learning. There are opportunities of getting together invaluable stores of knowledge at the Agricultural Colleges, but they are only opportunities, and they must be taken advantage of. Unless a man is really keen, a College will do very little for him.

And the novice has not only to be really keen, but able to learn. Can, however, a man set about learning farming at a College with no practical experience to go upon? Professor Wallace once said to me tersely that "what he attempts to learn before he acquires practical experience is of no value to him after he has gained that experience."

On this important point as to whether the farm training or the College training should come first—a matter little understood by the average townsman—I am happily in a position to present the opinions of some of the best authorities in the country, who have been kind enough to show much interest in my attempt of last month to explain the nature of the work the Agricultural Colleges are trying to do, and to answer the interrogatories I ventured to address to them.

I will first quote the views of the Heads of three teaching institutions which, though doing good work, are not, perhaps, so well known as some others.

Two Classes of Would-be Farmers

Mr. W. T. Lawrence, manager of the Cumberland and Westmorland Farm School, at Newton Rigg, Penrith, is in no doubt whatever on the point at issue:

"My experience as a farmer and as an instructor in Agricultural Science of long standing and my knowledge of farmers and farm pupils of all sorts lead me to be very decidedly of the opinion," he writes, "that the practical work on the farm should come first and the College work afterwards.

"And dividing townsmen who are contemplating farming into two classes, (1) those with capital and the desire to take a farm of under £400 rent, and (2) those with capital and the desire to take a farm of over £400, I further maintain that the former class must engage in actual farm work as pupils *thoroughly*, as they will have to be their own bailiffs and also have to put their hands to the work when necessary to make farming a success; and even those of the latter class will have to come into closer quarters

MR. W. T. LAWRENCE
Manager, Cumberland and Westmorland Farm School

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MR. JOHN PERCIVAL, M.A., F.C.S.
Director of the Agricultural Department, University College, Reading

with the work in all its departments than merely walking round with the master and hearing him give orders, &c.

"Those who look at farming from a distance with a view to engaging in it should actually participate in the less pleasant as well as the more pleasant phases of it, to test the reality of their desires, and industry, before risking capital in the undertaking.

"People of means who go into farming as a pleasant pastime, regardless of profit, are not, I presume, under consideration. They are a nice class of people to have in the country in many ways, and so long as they are not so numerous and so free in their offers as to raise rents all round and so injure the working farmer who has his living to get out of the land, they are an acquisition rather than otherwise in our rural districts."

Mr. J. F. Blackshaw, Principal of the Midland Agricultural and Dairy Institute, Kingston, Derby, which, he thinks, is "fairly entitled to rank in the first class of agricultural teaching institutions"—"we deal with a larger number of individual students than any other institution, and we undoubtedly have the greatest amount of accommodation for instruction in dairy farming and the manufacture of dairy produce"—says that he is "strongly of opinion that every student of theoretical agriculture or the sciences bearing thereon should have had at least a two years' acquaintance with practical agriculture before he enters the class-room; otherwise he is apt to form erroneous conclusions, and, generally, he is placed at a considerable disadvantage in that he is unable to assimilate the instruction from the practical standpoint."

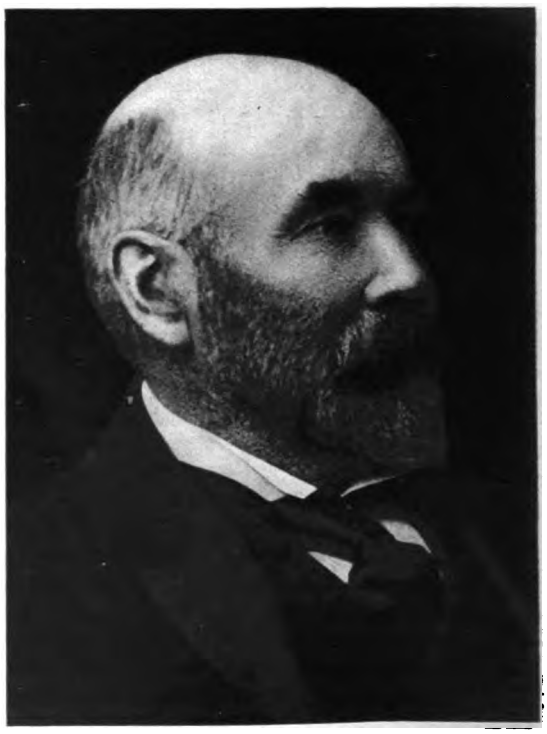
Mr. T. J. Young, Principal of Holmes Chapel Agricultural College, Cheshire, lays stress on the importance of local knowledge and acquaintance with practical farming. He says:

"Local practice has not been arrived at haphazard, but is the outcome of many years of life and observation of a particular soil, situation, and climate, and it may be, in some instances, by pretty severe lessons.

"Any student equipped with a fair knowledge of the practical matters entering upon a systematic course of training in the higher branches of his business will begin in a position of very great advantage over those who have not that favourable groundwork."

A Professor and the Merchant's Sons

Professor R. Patrick Wright, the well-known Principal of the West of Scotland Agricultural



PROFESSOR JOHN WRIGHTSON, M.R.A.C.
President of Downton College of Agriculture

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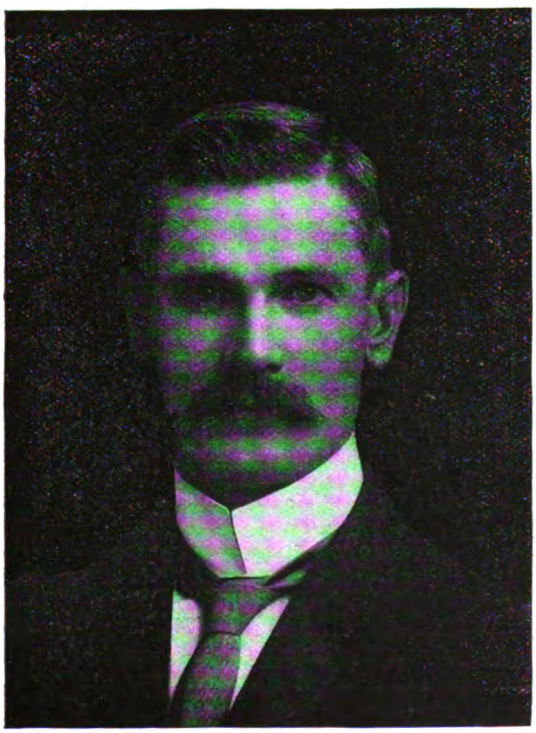
W. Crooke

PROF. ROBERT WALLACE, F.R.S.E., M.R.A.S.E.
Edinburgh University Agricultural Department

MR. J. SMITH HILL, B.Sc.
Principal of the Aspatria Agricultural College



PROF. DOUGLAS A. GILCHRIST, M.Sc., F.R.S.E.
Principal of the Armstrong College

MR. M. J. R. DUNSTAN, M.A., F.R.S.E.
Principal of the South-Eastern Agricultural College

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College, Glasgow, has been good enough to write to me at considerable length. His valuable letter is as follows:

"The statement appears to have been made to you that the ideal course is two years at an Agricultural College, followed by one or two years with some competent up-to-date farmer. I believe very strongly in the converse arrangement, and both from observation and from intercourse with those who have gone through such a course of training, I have no hesitation in saying that the student who goes through the classes of an Agricultural College without having first spent at least two years on a farm is in a great measure wasting his time.

"It is quite an erroneous impression that the young man who goes to a College after having been on a farm will have much to unlearn.

"The practice of farmers is generally sound and correct in regard to the ordinary routine and practice of farming, and a student goes to the College not to unlearn what he has acquired on the farm, but to add to the knowledge that he has already obtained much that he cannot learn from an ordinary farmer, but which may supplement his practical knowledge and lead him ultimately in some points to improve on his practice.

"I observe that the Colleges which you have put in the forefront of your article are all residential Colleges having farms attached to them; but while such farms have much value for research and experiment and as adjuncts to the teaching, it is quite erroneous to think that students can best acquire knowledge of the practice as well as the theory of agriculture at such Colleges. The experience of Cirencester long ago demonstrated that this idea was a fallacy.

"The conditions prevailing at College farms are not the same as those prevailing on ordinary commercial farms, but even if they were a student has neither time nor energy enough to learn the practice of agriculture at the same time as the theory or science. The whole mental powers of a student require to be applied fully for two or three years to acquire a knowledge of the science alone, and the more directly practical part of his knowledge must be gained at a separate period. If it is not gained beforehand it follows that during a great part of his College course he is handicapped by hearing constant references to practices of which he is ignorant, and consequently he is unable to understand the applications of science to practice as a student does who has had previous practical knowledge.

"I may add that I have every year inquiries from merchants in this city and other parents who are not farmers asking me to advise them as to the proper course of training to be given to their sons who wish to become farmers.

"I invariably urge them to send their sons to reside for two years on a farm where *not more than one or at most two pupils* are kept, and afterwards to come back to join College classes for two or three sessions and spend the intervals also on farms.

"I always advise them against sending their sons to the College too young, or till they have acquired a sufficient knowledge of practical farming to derive full benefit from the class instruction. Boys coming direct to the College from secondary schools never do derive such benefit as they should."

MR. J. F. BLACKSHAW, F.C.S.
Principal of the Midland Agricultural and Dairy Institute
(*From "Ice and Cold Storage"*).

The Cart before the Horse

To Professor Robert Wallace, of the Edinburgh University Agriculture Department, in which the science of farming has been taught for a longer period than at any other centre, I am indebted for the following vigorous notes:

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"The man in the street may think that a man can take his scientific training in agriculture before he has gained experience of the practical side of it, but to attempt to do so is putting the cart before the horse, or trying to build a house without a foundation.

"The system is condemned by every authority of any standing, either in this country or America, where they know what they are about. If you have any doubt about it, ask Dr. Somerville, of the Board of Agriculture, Professor Middleton, at Cambridge, Principal Bayne, Preston, Professor Gilchrist, at the Armstrong College, Newcastle-on-Tyne, or any one of the men in the enclosed Record of Students, who hold important teaching appointments.

"I have known of botanists getting into important agricultural teaching appointments, and other unpractical men in authority arguing in favour of the classroom work coming before the field work in a man's course of training, but it has never been a practical success anywhere that I have heard of. The Royal Agricultural Society's motto, as you say, is 'Practice with Science.' Science without practice is a myth which has done the great cause of agricultural education no little injury.

"It has also been my own experience as a teacher of agriculture for more than twenty-two years that, until a youth is about twenty years of age, or in many cases a few years older, it is a waste of time and money to attempt to properly interest him in the theories associated with a thorough knowledge of the subject, and that he is much more usefully employed in developing a wider personal experience of practical agriculture.

"A youth in his teens rarely acquires a sufficiently serious view of life to encourage him to put out his best mental effort, apart from the fact that at that early stage the brain is not developed so as to take full advantage of theoretical instruction.

"In an Agricultural School or under some systematic course of instruction what the young farmer should learn is not ordinary farm work, viz., to plough and harrow a given area in a day. He can become an expert in that kind of thing at home to greatest advantage, without cost for instruction. He requires to be taught just those things which are not to be learned on an ordinary farm, to have explained to him the meaning of processes which are founded upon scientific principles, and to become familiar with the common facts of those sciences which bear upon agricultural practice."

The Boy Who Would be a Farmer

Professor Wallace, it may be explained, has studied the subject of Agricultural education not only in Scotland and England, but in the New World, India, and the Colonies.

Professor Wallace has mentioned among his authorities Professor Gilchrist, Principal of the Armstrong Agricultural College (in connection with the University of Durham), Newcastle-on-Tyne. In a businesslike paper on "The Education of the Young Farmer," contributed by Professor Gilchrist three years ago to the *Journal of the Royal Agricultural Society*, there are several passages bearing so closely on the present discussion that I propose to summarise them. Premising that "the first qualification of the successful farmer is that he must be a good business man, and a thorough business training should therefore be aimed at," Professor Gilchrist says the essentials seem to be in the case of the farmer's son who would also be a farmer:

"(1) A good elementary education until the boy is twelve or thirteen years old.

"(2) From twelve to fifteen, or possibly sixteen, send the boy to a really good secondary school, where he should receive, with a good general training, special teaching on the commercial side, including bookkeeping, and in addition a good grounding in elementary science. The teaching at this stage should not be applied to any great extent to agriculture itself; but the scientific teaching should, as far as possible, be illustrated by familiar objects on the farm, such as the characteristics of farm crops and plants, and the habits of farm live-stock, birds, and vermin. Some knowledge of common insects and their habits and of elementary physics and chemistry should also be imparted, these subjects being as far as possible accompanied by simple and interesting illustrations of common farm phenomena.

"There are numerous secondary schools throughout England which have been remodelled upon previously existing foundations—many of them also subsidised by County Councils—that are in a position to provide a really good training and to impart instruction well suited to a farmer's son at this stage of his education. It is absolutely essential for success, however, that the headmaster of such a school should be in sympathy with the farmer and his calling, and should fully recognise the character of the teaching required.

"(3) The boy should now return to the farm for one or possibly two years. During this time he should acquire facility in all practical work on the farm, he should become familiar with the management of a horse at all kinds of farm work, and he should have some practice at ploughing, mowing, stacking, thatching, milking, and similar operations. On his father's farm he cannot be under the same discipline as at a school; and it is therefore strongly advisable that he should report on all his work to an outside authority—for instance, to the professor of agriculture at the College where he will take the course described later.

"At this period of his career it is essential that he should not be disheartened by getting

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too much of the hard work of the farm : in other words, the object should be not the completion of the work, but the training of the boy. If he has been intelligently instructed in subjects like the natural history of the farm, his work will be far more interesting. This is the age at which the boy is most hopeful as to his future as a farmer. In fact, there is no greater treat, when one has the opportunity of walking over a farm, than to secure as guide the farmer's son at this age. Going round the buildings and land with him, and discussing the merits of the live-stock, one shares his enthusiasm, and carries away when the visit is over a vivid impression of the inner life of the farm."

The Farm Pupil System

Some pointed remarks on the farm pupil system follow :

" The practice on some English farms of receiving pupils for practical training does not, on the whole, give good results, the reason being that in many cases the pupils are not trained in practical work, simply because they prefer to ride or shoot, or otherwise enjoy themselves, and, if they pay a sufficiently high premium, the farmer has no pecuniary object in making them work. Further, it has become customary to send the young English ' ne'er-do-wells ' to a farm as a last resource, and these, in many instances, do great harm to those with whom they associate. No pupil should be put on a farm at a high premium, but rather on the understanding that his work shall partly pay for his keep.

" A farmer is seldom a disciplinarian, and I repeat that there should be some authority to whom regular reports on the farm work should be sent by the pupil. The feeling among the best Canadian agriculturists is very strong against paying premiums at all. They urge that in Canada farm labour is always valuable, and that a man who is willing to work should be worth his keep. On the other hand, they do not wish to have ' loafers ' on their farms, and such they have found many pupils to be who have come to them willing to pay premiums. In the course of a visit to Canada I realised how strong the feeling is against ' loafer ' pupils, who are too well off to throw themselves into the manual work of a farm, proficiency in which is essential for their success. Such pupils almost invariably succeed only when their remittances are cut off, and they are obliged to work to earn for themselves a living.

" I wish to emphasise strongly the importance of a farm training between the ages of sixteen and eighteen, when the mind is most receptive. If left till a later period, very valuable time is lost, and the practical work is not entered upon with the same zeal and enthusiasm.

" I am firmly convinced that a great deal of the American ' go ' is attributable to the fact that when a young American decides to be a farmer, he is put to the practical work at this age, and is not allowed to spend the time between sixteen and twenty, and even over this, leisurely discussing with every one what he had better take up as his life's work, and aimlessly attending some school or following some course which it is more than likely is anything but fitted to prepare him for the career he will ultimately decide upon."

A College Course of Instruction

Professor Gilchrist then deals with the training at an Agricultural College :

" (4) The lad, having now acquired a knowledge of and familiarity with farm operations, cannot do better than devote one or two winters to a really practical course of instruction at a College. He should spend the summer months of the year on the farm, which, as a rule, are the most important for the practical work.

" The College teaching which is most likely to be of the greatest service should be somewhat on the lines of the following syllabus :

" (*a*) Soils and Manures.—Classification of soils : clay, loam, sand, marl, chalk, peat ; variation in fertility, and suitability for different crops. Drainage of soils. Indications of fertility. Variation in climatic conditions. Suitability of different soils and districts for cropping and pasture. Sheep farming. Dairy farming and rearing of live-stock. Cultivation of soils, such as ploughing, sub-soiling, fallowing, and autumn cultivation. Lime, chalk, and marl. Farmyard manure : its production, composition, and variation in character and value ; its application to crops. Artificial manures : nitrate of soda, sulphate of ammonia, bones, dissolved bones, superphosphate, basic slag, kainit and other potash manures. The choice, purchase and application of manures.

" (*b*) Crops and Pasture.—The cultivation and management of wheat, barley, and oats ; of beans and peas ; of cabbages, mangels, turnips, and swedes ; of rape and mustard ; of sainfoin and lucerne ; and of temporary leys for hay and pasture. Management of pasture and meadow land, and the laying down of land to permanent pasture.

" (*c*) Live-Stock.—The principal breeds of horses, cattle, sheep, and pigs ; their care and management. The suitability of the various breeds for different districts. Stud, herd, and flock books.

" (*d*) Foods and Feeding-Stuffs. — Feeding of horses, cattle, sheep, and pigs, at different ages and under different conditions. Rations for different classes of stock. The economical use of home-grown and purchased foods. Relation of food and manure.

" (*e*) Hygiene of Farm Animals.—The general conditions of health. Sanitation of farm buildings. Management of the mare, cow, ewe, and sow in breeding and producing young. Dentition and its indications of age. The management of farm live-stock in health and disease.

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"(*f*) INSECT PESTS AND PLANT DISEASES.—The common animal parasites, insect pests and plant diseases, and methods of dealing with their attacks on animals and on crops.

"(*g*) FARM-BOOKKEEPING.—Farm account books, and how they should be kept. Valuations: tillage, farm stock, and effects.

"(*h*) MENSURATION AND SURVEYING.—Measurement of stacks and ricks, and of heaps of manure, roots, stones, or other material. Measurement of timber. Chain surveying.

"The course should also include some instruction in elementary science with its bearings on farm practice, as well as some lectures on the agricultural imports of this country and the prices of agricultural produce. Some lectures treating of the agricultural produce and capabilities of different countries and the possibilities of these countries in the future might well be given."

THE FARMER AS BUSINESS MAN

Finally, we have the following pertinent observations on the farmer as business man:

"This commercial side of the farmer's training is, after all, the most important. When we talk closely to our most successful farmers and gain their confidences, we cannot but recognise that it is their business qualifications which have brought them to the front. Very great harm has been done in the past to the cause of agricultural education by insisting that scientific teaching was of the greatest importance, and in many cases this has been taught only, while the most valuable part of the training has been excluded. It is all-important to the farmer that he should be able to buy and sell to the greatest advantage, and also to decide, not only what kind of produce will suit the farm best, but also what will find the best market in the district in which the farm is situated.

"(5) If the young farmer means to give attention to dairy farming or poultry keeping, he should now undergo a short course of instruction in one or other of these branches. If, however, general farming is his object, he would find it immensely to his advantage to spend a year on a really good farm of the type on which he is likely to settle afterwards, and with somewhat the same conditions of soil and climate.

"No question will be likely to give him more trouble than that of labour, and it is essential for future success that the farmer of moderate means should be his own foreman, a good organiser of labour, and able to exercise that tact and kindly sympathy which help so much to bind good men to their employers.

"At the same time it must be remembered that any such training is not complete until after years of ripened experience, which after all is the basis of the success of our best-known English farmers."

Both Professor Gilchrist and Professor Wallace lay stress on the experience of Ontario Agricultural College. "One of the essential conditions of entry," writes Professor Gilchrist, "is that students must be familiar with practical work on the farm. Before this rule was brought into operation, the results were not nearly so satisfactory as they are now." And in a note to me, he adds: "Both in this country and in Canada the men who have made good use of a scientific training have almost invariably had a practical training in farm work before taking their College course."

CAMBRIDGE UNIVERSITY AND FARM EXPERIENCE

I have also the pleasure of reproducing some notes kindly sent me by Professor T. H. Middleton, M.A., of the Department of Agriculture, Cambridge University, one of the eminent agricultural teachers responsible for the admirable new *Journal of Agricultural Science*:

"Continuous courses are best for training teachers, but for farmers the winter course on the Yorkshire (Leeds) plan is best. The townsman's difficulty is to get a practical knowledge of farming. He should spend from April to September on a farm and get his theory in winter.

"I recommend from six to eighteen months on a farm before studying the theory of agriculture. It is most difficult for a student who knows nothing about farming to follow lectures on agriculture. I try to get all students to spend vacations on a farm while engaged in theoretical study."

It will be seen that the advice of all these eminent authorities is in the same direction, that without a groundwork of practical knowledge the attempt to study theory is unlikely to lead to satisfactory results.

TOWNSMEN IN A MAJORITY AT TWO COLLEGES

From Mr. J. Smith Hill, Principal of the Agricultural College, Aspatria, Cumberland, of which Sir Wilfrid Lawson is President, I have the following interesting letter:

"Speaking from my experience at Aspatria, I believe it is the 'townsman' who sees the value of a scientific training who mostly uses the various Agricultural Colleges in England.

"Possibly in the next generation a greater proportion of farmers' sons who intend to farm will attend College courses. I believe Scottish farmers already appreciate College courses more than English ones do. See the attendances at Glasgow, Edinburgh and Aberdeen, compared with students who are sons of farmers at English Colleges. Among my Scottish students I have had

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a much larger proportion of farmers' sons than I have had in the case of English students."

Mr. W. Sillito, secretary of the Agricultural College and Training Farm, Alvecote Priory, Tamworth, is also struck by the proportion of townsmen desirous of learning farming:

"Nearly all the pupils who come to us are sons of gentlemen not connected with farming. We have not had above a dozen farmers' sons in the whole nineteen years of our existence. Ninety per cent. of our three hundred pupils in the last nineteen years have gone out to the Colonies.

"With reference to your paragraph about pupils at Wye working by candle-light in their rooms after 11 P.M., we do not find a similar practice here. I have not known three pupils out of three hundred who would do this. Moreover, as you elsewhere remark, early rising is very important for such pupils. In farming

He who would thrive
Must rise at five;

and it is far more important to get used to rising at five than to study after 11 P.M. A youth cannot possibly do both, as you will admit."

How Paterfamilias May "Farm"

Mr. Sillito adds this interesting postscript to his letter:

"You might show that the great charm of farming is in the constant variation of employment. At all times in every week, for instance, there is great diversity of employment, and a further change occurs at every fresh season of the year. 'There is ever cheer in change,' as the saying is. In the Midlands, too, we say, 'Change of work is half-play.' In farming there is a little to do with animals of various kinds, a little to do with soils in field operations on arable land, and a little to do with engineering, and machinery and bookkeeping. A little measuring and surveying, a little blacksmithing and carpentering and veterinary work in simple diseases, and sporting, tree-planting, fruit-culture, gardening, bee-keeping, poultry, an endless variety of occupations, as you see. You have not dwelt enough on the pleasures of this great diversity.

"One more point. If a father in town renting a villa in a suburb at about £50 or £60 would let one of his sons turn farmer and be trained till he was nineteen or twenty, then take a farm at £100 to £150 a year for his son, and live with the son, all the rent and rates and fire and lights and servants' wages and gardening at the villa (which cost the father in all £100 to £150) would pay the rent of the farm and enable all the family to enjoy the life of a country gentleman for ten years or twelve years till the farmer-son wanted to get married. Is there not something in this prospect to tempt many a townsman into the country?"

Paying a Premium to a Farmer

The type of many students of farming on a premium-farmer's holding is well known. The youngster gets down about eight—he ought to have been on the doorstep as six struck, when the hands were given their work for the day—and later on goes hunting or shooting or tennis-playing, instead of giving an eye to what is going forward in the fields or in the stock-yards. In the evening he is out at a bridge party. "Doing any good for himself?" two farmers who have pupils lately answered me in almost identical words, as to pupils concerning the success of whose careers I was sceptical; "of course he's not. Dunno why he's here. He make a living for himself! Never! But what am I to do? His father will have him stop and won't give him a talking to, and the 30s. a week's handy in these days when there's not so much coin going."

I write feelingly, for I once paid the premium for a would-be student of Agriculture who was apprenticed to an excellent farmer, and though neither the farmer nor I neglected the "talkings-to," the young fellow would not learn, and eventually in his fourth year said he wanted to "give up the farming." He was allowed his wish. In the next line he chose he was permitted to make his own way. Arrived now at the years of discretion he realises the opportunities he missed and wishes he were back on the farm. Some day he may get back—by his own unaided energies—and will then probably prove a success. The moral is to be sure of the stick-at-it-iveness and abiding interest of the would-be student of Agriculture before sending him to study at either a College or a farm.

Here is a story told me by Mr. Dunstan, of Wye: "One of our most influential farmer neighbours was years ago learning farming in Scotland with a well-known Scotch farmer who 'took pupils.' One day a young man arrived in faultless farming attire, attracted by the reply to his advertisement to have a week's trial. During his stay matters were very lively—picnics, tennis, and all sorts of gaieties of which the young man was the leader. At the end of the week the question, 'How do you think it will do?' was asked. He replied that he could not quite make up his mind. He had advertised and had one hundred replies, and he was now going round to spend a week with all his answerers and would settle later on.

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Verb. sap. One advertisement lately from one of the colonies for 'pupils' advised the 'pupils' to bring a dress suit, a tennis-jacket, and a gun!"

Not so long ago, I may say, some inquiries as to the "ruling rates" for tuition and board and lodging on a farm were made on behalf of a would-be Back-to-the-Lander of thirty-seven. He was, of course, thoroughly keen. His aim was to learn "how to make a modest living out of a small farm." He described himself as a townsman of education who had lived two or three years in the country, and as a handy man not afraid of work. I may summarise the offers he received as follows:

(1) Farmer, thirty-six years. Mixed farm. Inclusive terms per year, £50.

(2) Dairy farmer on two hundred and fifty acres. Ten years on own account successfully. £58 10s.

(3) Farmer's son with fifty cows and two hundred ewes. Been at farming six years. £78, and pupil "might be ready for his small farm in a twelvemonth."

(4) Another farmer's son on a large farm with long experience. £100, but would take £60 if applicant is a worker. "A year at least would be required to see the general routine of work, but everything cannot be learnt as seasons and conditions are so varied that a farmer is always learning."

(5) Farmer of considerable experience with large head of stock on five hundred acres. £100.

(6) Farmer who thought his place too big to suit. Charge, 100 guineas. "You might succeed in farming for yourself after two years' experience if you are really keen and work well."

(I may just mention that the Principal of a well-known Agricultural College, on looking over my proof, wrote against this optimistic view: "Rot!")

(7) Two hundred acres, experienced farmer who believes in milk. 100 guineas. "It is difficult to say how long it would take a man; it all depends upon how much the man knows now, and his capacities for work and the acquisition of knowledge."

(8) Another large and plainly successful farmer, who also asks 100 guineas and believes in milk. "As to time of learning, it all depends upon the man. One pupil left after eighteen months and did well; but as applies to lads at school, so to pupils to farming: one gains so much quicker by observation, &c."

(9) A third farmer on a large area, who, like some of the others, makes a speciality of pupils. Asks also 100 guineas.

Although I have used the word "premium-farmer," it is obvious to any one reading between the lines of the letters from which the extracts are made that several of the writers have done well in farming, and would probably prove excellent teachers; and that there is, of course, up and down the country a number of worthy men in whose care young men would have the best opportunity of learning a great deal about farming.

A Plain Message to the Townsman

I will conclude this article with the following report of a conversation I lately had with Mr. Dunstan, Principal of the South-Eastern Agricultural College (which happens to be the institution nearest home), where I spent an agreeable afternoon and evening a few weeks ago in the company, not only of Mr. Dunstan himself, but of Mr. Robinson (the Vice-Principal), Dr. Russell, and other members of the staff of the College.

"Well, to start with, the training for farming, here and on a farm, costs less, I suppose, than the training for the professions. That is something perhaps, though, I need not say, I only put it first because it comes into my mind first. For it is no earthly use any one contemplating farming who is not fitted by temperament and inclination and capacity for it. A love of the land, a liking for the life of the farmer, and a pleasure in handling stock and an eye for stock are absolutely indispensable. Not one of them can be done without. Then it has to be realised that a really good training, that an educated intelligence, is needed. A new class of men is going into farming, and the standard will be higher and the competition will be more severe than in the past. Again, it must never be lost sight of for one moment that the ability to work the land and produce crops—long learning though this needs—is not everything. Without skill in buying and selling, mere skill in producing counts for little."

"The buying and selling trades in the country districts," I said; "the butchers for instance, the greengrocers, the higglers, the corn merchants, the hay and straw dealers flourish, but some farmers, equally clever in the department of producing, are doing less well."

"Quite so," said Mr. Dunstan. "Farming is successful, I often tell the students, by paying attention not only to the pounds, but to the pence column. Think of what a loss of a

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shilling a day per head on a lot of beasts means on sale day."

"A veteran and most successful farmer of the old school," I rejoined, "lately laid great stress in talk with me on the importance of buying right. 'Don't pay more than you should, but buy good stuff, and if so be that you have to give an extra pound, why it's worth it, for when you come to sell there's a demand—there's always a demand for good stuff, however slow the trade in medium—and, as like as not, the extra pound you invested will bring you £3 back.'"

"Sound doctrine," Mr. Dunstan agreed. "There's always a market for really tip-top stuff. The fault about some futile plans of agricultural co-operation was that they were laid on a basis of trying for first-class prices for second-rate stuff. Which is absurd."

"But getting back to our townsman," I murmured.

"Well," said Mr. Dunstan, "he should surely count the open-air life as worth something. Then if he really won't come and learn farming, but insists on a short cut, he will have to have a bailiff. And as it is above all things necessary that he should start right, let him choose him well. Many would-be bailiffs are broken-down farmers. If they have failed to make their own farm and their own capital and their own labour yield a dividend, why should they be expected to be able to work wonders with a stranger's farm, a stranger's capital, and other people's labour? Let our friend be most careful then to choose the right bailiff. To be the son of a successful farmer is perhaps the best testimonial an applicant can show. Then pay him well. Two pounds a week is not too much. Next, treat him well. Beyond the perfect bailiff—when you have the good fortune to find him—there will, of course, be £10 per acre of capital wanted and a half-year's working expenses. But let the breeding of the bailiff be inquired into as the breeding of any pedigree stock that may be bought, for on the amateur's farm everything depends upon him alone."

"And what interest is the pleasure farmer likely to earn on his capital," I inquired, "assuming that he does not, like one friend of mine, bring down the grey hairs of his bailiff with sorrow to the grave by reason of his 'improvements'?"

"Possibly, three per cent."

Three per cent.! Let the cold, commercial truth sink into the mind and heart of the Londoner sighing for a pleasure farm as a profitable investment. And, for the same reason that Mr. Nevinson follows each of his essays with a poem, "in order to prolong the mood," I append the following chastening quotation from *Elements of Farming*, by Mr. Primrose McConnell, Bachelor of Science in and Professor of Agriculture and farmer:

"Farming is pre-eminently a practical business. It is largely an accumulation of experiences bought on the usual costly terms. If any one becomes a tenant of a farm and thinks he ought, by much knowledge of chemistry, botany, geology, and half a dozen other 'ologies, to become a burning and a shining light in his neighbourhood, he will speedily realise what is meant by the somewhat vague expression 'agricultural depression.' An acquaintance with the *minutiæ* of any particular branch of science bearing on farming, though exceedingly valuable and interesting, is not farming; and the man who gives too much time and attention to these, and at the same time attempts to run a farm, will probably come to a bad end.

"Financial success depends on many things which cannot be reduced to the rules of science and bulk very largely in the everyday experience of all farmers. Excessive wet, excessive drought, beer, inefficient workmen, railway rates, foreign competition, dilapidated buildings, and a host of other troubles will each of them do as much harm to a farmer as complete ignorance of scientific knowledge. One-half of the management of a farm consists in buying and selling to the best advantage; knowing when to buy and when to sell; buying in the cheapest and selling in the dearest market—items wherein the shrewd business man has the pull, and which the best educated and most scientific farmer cannot afford to ignore."

May I add in conclusion, in regard to the Agricultural Colleges, whose work has been outlined last month and this, that Lord Onslow's remark to me that the public may have confidence in the institutes to which the Board of Agriculture makes grants does not mean that the Colleges which do not receive Government assistance are unworthy of patronage. One of the most able agricultural teachers in England, Professor John Wrightson, is at the head of Downton, which is doing admirable work. Lots of good men have also been trained at Aspatria College. The Royal Agricultural College at Cirencester is yet another of the institutions which, if for no other reason than that they are proprietary instead of being supported by County Councils and endowments, have not the ordinary claim upon financial support from Whitehall.

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WHERE THE BRITISH GROWER FAILS

MARKET GARDENERS WHO ARE BEHIND THEIR FOREIGN RIVALS—"SECOND QUALITY" PRODUCE—CARELESS PACKING—ANTIQUATED MANAGEMENT OF ORCHARDS—THE BRITISH GROWER NEED ONLY TAKE TROUBLE—THE QUESTION OF RAILWAY RATES

BY

S. L. BASTIN

IN these days there is much talk about the decadence of British industries: a little sense and a good deal of nonsense has been written and spoken during the last year or so on this admittedly most important question. One man gives it as his opinion that nothing but the rearing of a high tariff wall will restore that prosperity which otherwise the country will never know again. Some one else says that the whole difficulty will be met if the British producer will only "wake up": if he will use modern methods and adapt himself more readily to his customers' requirements, then he will successfully hold his own against all comers. Whatever views one may hold on the matter in its broadest issues it would be foolish to shut one's eyes to the fact that in the case of many industries the Britisher is woefully behind his foreign rivals. Perhaps in few directions can this be seen more clearly at the present day than in the market gardening world.

Now the whole secret of success in any business may primarily be summed up in one word—excellence. If we look round at the most prosperous firms, no matter what is the nature of their business, it can be readily seen that their splendid connections have been brought together simply because they have always made it their aim only to give their customers the very best of whatever they may deal in. Mark, they do not succeed because they charge low prices for their articles. It is notorious that many of the largest business houses in the country obtain the highest prices, and yet the public crowd to do business with them. Why? Simply because every one knows that so-and-so's things can always be absolutely relied upon: there is never any doubt as to the quality, it is always the best. People therefore cheerfully pay perhaps half as much again as they would have to pay for their goods at some less reliable dealer's.

It is just here where the British market gardener is failing at the present day. Consider the following little everyday instance to illustrate the point. A lady was heard to remark that her household was very fond of celery. But she went on to say that she very rarely purchased it, as the quality was almost always inferior. She would gladly pay double the ordinary price, if she could rely on getting really good "sticks." Yet our gardeners are quite content to go on producing celery of very indifferent quality, thereby spoiling their own and their retailer's custom. And after all it is just as easy, while you are about it, to grow good celery as it is to grow bad.

The above may be said to apply to almost the whole of the more common vegetables, with the exception possibly of the potato. The market is flooded with second quality produce, but there is really a small amount of fine stuff. It is astonishing how little care is taken on the part of the growers regarding the cultivation of those varieties of vegetables which are the best and most tempting from the customer's point of view.

In the matter of fruit farming the British producer is far behind his foreign competitors. Experts declare that there is no country in the world in which such finely flavoured good keeping apples can be grown as in England. Yet only the other day we heard that some of the London fruit shops have almost given up selling British apples, because their customers like the Californian ones better. They will tell you that these foreign apples arrive in a much finer condition, and that they look so much better for dessert. The British grower too often sends his fruit all jumbled together in a barrel or basket, good, bad, and indifferent mixed up anyhow: then he grumbles at receiving a low price for his produce. The foreigner carefully grades his fruit, selecting in the first instance only the very finest of all.

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These he neatly packs in boxes, perhaps even going so far as to wrap each fruit separately. This all means trouble certainly, but then he gets a tip-top price for the best of his produce, and the remainder he can afford to sell at a low rate, because he has already received back the best part of his money.

Every one must have noticed how nicely the French plum and greengage growers pack their specially selected fruits in well-made boxes fringed with ornamental paper. The fruit is so well protected that it arrives in this country in the "pink of condition." English growers may laugh at the fastidiousness of our neighbours on the other side of the Channel, but customers are certainly attracted, and money is diverted from the pockets of the British producers. It is well to bear in mind the old saw that he who laughs last, laughs the loudest.

Many growers are ridiculously antiquated in the management of their orchards. They stumble along year after year with their old trees, mostly poor varieties quite unsuited to modern requirements. The writer well remembers a few years ago wandering round an orchard in the West of England. The trees were bearing splendid crops, of what were supposed to be good eating apples. Subsequently on sampling a selection of the various kinds it was found that there was scarcely one which could be called in any sense a finely flavoured fruit. What chance of obtaining a good price in the market could these apples be expected to stand against such varieties as "King Pippins" or really fine "Blenheim Oranges"? And there is always a demand for these good varieties. Even in the last year of plenty the splendid "Cox's Orange Pippin" realises 10*s*. a bushel as against 3*s*. or 4*s*. for inferior kinds. That the British grower can hold his own, if he will only take trouble to bestir himself, can scarcely be better illustrated than in the case of hot-house grapes. English grown fruit certainly equals, and indeed more often than not surpasses, that which is grown in any other country. It is so good, as a matter of fact, that the foreigner does not stand a chance. Practically speaking, all the hot-house grapes on the market are British. This is true also to a certain extent of the best quality peaches and nectarines.

It is pleasant to be able to record that the British flower grower is rapidly coming to the forefront. The clever system of the retardation of plants by keeping them in a refrigerator is essentially a British invention. When going over a big Hertfordshire retarding establishment a month or so ago, the writer's attention was directed in the packing-department to a quantity of white Easter Lily buds. The manager proudly said that they were going to Paris. One could not help thinking how amused our French friends would have been a few years ago had the possibility of dull England exporting flowers to Paris (of all places in the world) been suggested to them.

The point has often been urged in defence of British growers that the foreigner enjoys the inestimable benefit of an almost perfect climatic condition. This is not by any means the case. True, on the one hand the Californian grower, for instance, may find that his plants grow more luxuriantly and produce fruit more abundantly than is the case in England; but as against this he is distressed by insect and other pests which attack his charges with a vigour and persistency undreamt of in this country. Many of these sunny lands are subject to sudden and violent changes of temperature, which, though lasting perhaps only a few hours, cause infinitely more damage than a week of May frosts in Britain.

It must be admitted that the market gardeners have suffered, and indeed are suffering grievously, at the hands of the railway companies. Fancy such a case as the following being possible in an enlightened country like our own. A Somersetshire gentleman had more apples than he knew what to do with. He offered to send some to a friend, providing that he would undertake to pay the carriage. Inquiries were made concerning the cost of transit over a matter of twenty odd miles. It was found that the expense involved would really be greater than the price for which his friend could *buy* American apples in his own town! A few of the more enterprising of the companies are beginning to realise that it is to their interest to meet the growers. It is probable, however, that nothing short of actual legislation will set the matter right. May the day be not far distant when our lawmakers will give a little of their time to the consideration of this most urgent matter, which is vitally affecting one of our most important home industries.

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AN INDICTMENT OF THE MODERN CITY

THE DEATH-RATE TEST—POVERTY, IMPURE AIR, STALE FOOD—LONDON AT THE BAR OF SCIENCE—HOPE IN HITCHIN AND DUNFERMLINE—BUT FOR THE ACCESS OF FRESH BLOOD FROM WITHOUT LONDON WOULD BE DEPOPULATED IN THREE GENERATIONS—THE WAY TO REFORM

BY

C. W. SALEEBY, M.D.

GIVEN sufficiently bad logic and a sufficiently ingenuous and uncritical observer, there is no lie that cannot be bolstered up by statistics: though this is not to say that almost all problems are not finally solved, if at all, by the scientific use of the statistical method. Now the death-rate is perhaps as familiar as any statistic, and the public which quotes it is not prone to worry about the difference between what the expert calls the "crude" and the "corrected" death-rate. But even when the usual corrections are made, we find that the death-rates of large cities compare very favourably with those of rural districts and small towns. The Londoner may thus frequently be heard quoting the low Metropolitan death-rate in support of the contention that London is "one of the healthiest places in the world": which I here propose most strenuously to deny.

My space may be better occupied than in discussing at length the numerous facts which explain the low death-rates of large cities, and utterly invalidate the apparently obvious conclusions therefrom. Amongst such facts are the superior sanitation of the city—an accidental advantage which it will soon cease to possess; the constant influx into our cities of the most energetic and vigorous (*i.e.*, the least likely to die) from the country districts; the constant exodus of the invalid and the moribund; the superior medical provision; the relatively small number of the infantile and aged, who make the major contribution to the death-rate. Let it suffice that he who would infer the healthiness of cities from their low death-rates (*relatively* low, for they are, of course, at least twice as high as they should be) is totally unacquainted with the most elementary principles of statistical criticism, and should confine himself to, let us say, the discussion of athletic records.

The first and gravest count of my indictment is that the city is the maker of poverty. This is not to say that there are no poor people in the country, but it is to assert that the veritable poverty, that body- and soul-destroying force which "makes a goblin of the sun," is essentially a product of city life as we understand it. Now a poor man is, as a rule, a *poor man*: physically—and therefore, on the average, mentally—a poor specimen of humanity. And it is the city that maims, dwarfs, and distorts him. This count of the indictment, then, merely summarises the effects wrought by certain facts of city life which come under the biological or medical accusations now to be considered.

City life, not necessarily and in the future, but avoidably and in the present, implies overcrowding. Now it is an error to imagine that overcrowding is an evil as such. It would be a curious anomaly if man, who is *par excellence* the social animal, must necessarily suffer by reason of contiguity with his fellow man. My neighbour and I ought to be the better for one another's company, but that, in contemporary civic conditions, it implies the breathing of vitiated air by both of us. However, I have already had an opportunity of discussing in these pages the importance of pure air. We merely note that the city, as at present understood and observed, is an enemy of that prime respiratory requirement which man shares with the ox and the oak and every living thing. Yet a city of pure air is not only conceivable, but is now being built not many miles from that Minotaur, demanding a tribute of more innocent lives every hour than did his ancient prototype in a year, which we

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call London. Tuberculosis is the most deadly of all diseases: *and its incidence varies directly with density of population.* If the apologist for our cities wants a statistical fact worth pondering over, there is one for him.

Again, the citizen is a stranger to pure air, not merely because there is so many of him, but because he burns coal, and burns it uneconomically, dirtily, and dangerously. His air is not merely an impure mixture of gases, but is loaded with deleterious solid particles as well. The lungs of the Eskimo are a pearly white; of the average Briton, a dirty grey; of the Londoner, coal-black—which is indeed to be expected, since they are full of coal.

The filthy fashion in which we citizens keep ourselves warm, burning our coal in open grates, obscuring the sun with the consequent fogs, and then groping about with torches through our self-made plague of a darkness which may be felt and smelt and tasted—furnishes another count of my indictment: that the modern city is an insult to the sun, which is the proximate giver of life, and the great antiseptic. Sixty per cent. is the proportion of sunlight cut off from the citizens of London by the dirt in their atmosphere.

But if the modern city is to be condemned on the score of air, and on the score of light, so also it is not without condemnation on the score of food. A city should be, and the future city will be, not a whole in itself, but indivisible from a circumjacent food-producing area. The two should form one whole; and the size of the city should be naturally limited by this consideration. But at present no rational methods prevail in the food supply of the city; and indeed they hardly can prevail whilst cities are irregularly distributed without relation to the food factor. In London, to take an extreme case, the adequate supply of good food is impracticable; and the local authorities are not even able to control such incalculably important factors in the well-being of a city as the supply of milk. The consequence is that, as has been proved, milk which has been condemned in Manchester as unfit for human consumption may be sent to London and sold there. Many times a day does the East End doctor see cases which demand, before all other things, a liberal supply of pure milk. But what orders is he to give? Pure milk is not to be had. It needs little consideration to see that, in the matters of freshness and quality of food, the modern city is much to be pitied.

The city, then, the maker of poverty, is to be condemned as largely producing its poor by means of, and then continuing to provide them with, impure air, deficiency of sunlight, and stale and often dangerous food. Against these may fairly be noted the excellent water supply of the average modern city.

Who, then, will be surprised to observe that the evidence for the physical deterioration of which so much is now rightly being heard is derived from the urban districts almost alone? Here is statistical evidence not subject to the many fallacies that attend the popular interpretation of the cities' death-rate. It is the growing child of the slum that is deteriorate: not because there is anything inherently the matter with this people, but because whole and worthy human beings cannot be reared in conditions to which none of us would submit a valuable dog or pigeon or flower-bed. Reform the cities, and the last will have been heard of physical deterioration. Of course, I admit the validity of the expert evidence that it is, proximately, the feeding of the city child that is defective; but why should not the feeding of the country child be equally defective, if there be not something in the fact of city life which affects not only the child's body directly, but also the parent's mind, and thus his treatment of his child, as regards food especially?

And here is a last argument for those who put their faith in London's death-rate. How comes it that such diligent students as Dr. James Cantlie and Dr. Harry Campbell are unable to find, between them, more than half a dozen specimens of the *Londoner* in all London—such being defined as one all four of whose grandparents were born in London? But for the constant access of fresh blood from without, London would be depopulated in three generations. Is it, then, with anything but alarm that the serious student contemplates the fact, never too frequently to be remarked, that 77 per cent. of the population of these islands now live in cities, as compared with 51 per cent. half a century ago? Observe that these figures speak not of a mere inevitable growth of population, but of an extreme and progressive change in the *distribution* of the people. Be assured there are bigger and more vital questions of redistribution than the present Government proposes to discuss when it has nothing else to do.

But these medical considerations, and the biological evidence as to the fertility or infertility of city dwellers must be supplemented by others, relatively subtle, but equally important. Let us proceed from physiology to

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psychology: from the body of the citizen to his mind.

We have seen that existence is more difficult to achieve in the city than out of it; and it follows that the "struggle for existence" must be keener. From this, again, as any sociologist knows, it follows that crime, which is mostly an expression of the unrestrained struggle for existence, will be fostered. Nearly all the "diseases of Society" are the diseases of cities. From crime we may distinguish what we call "vice." No one needs telling how largely this is one of the foul spawn of the modern city. And in this connection one may note a grave moral danger of overcrowding not to be forgotten when we discuss the physical danger of impure air. In only too many of its poorer quarters, the modern city is the foe of common decency.

I have referred to the physique of the citizen, and to his morals. What of his art, his relation to Nature, his love of beauty? Here, again, the city is condemned. Music may flourish in the modern city; and the drama; and a mean substitute for literature; but all the arts of a large city tend to debasement. For music we get musical comedy; for drama, dancing dolls. Athens produced incomparable works of art, in drama and architecture and sculpture; but her population was not five millions, but *thirty thousand*—just the number about to be provided for in First Garden City!

But be assured that, whatever the popular verdict, our cities of to-day have been condemned by the only judges worth considering—the few who manufacture and circulate ideas, as others do boots or brandy. The magnificent and assuredly classic labours of the Right Hon. Charles Booth are being emulated by students of lesser cities, so that soon no self-respecting city will remain unstudied after the fashion of his study of London. Professor Patrick Geddes has had the opportunity, surely unique, of studying a small city—Dunfermline—with a view to spending half a million of money in its amelioration. Mr. Carnegie's beneficence to his native city promises to benefit many another: for when Dunfermline is remodelled, and has been visited by the enterprising inhabitants of less fortunate cities, a general renascence will be insisted upon. By that time we may hope that Mr. Cadbury's model village, Bournville, and Mr. Lever's Port Sunlight will have had to yield precedence to First Garden City at Hitchin, where smoke is not to pollute the air, no slums will be found, every house will have its garden, none will cut off light from another, food will be fresh, streets and buildings will be deliberately planned with reference to beauty of composition and of detail; and, in short, there will be seen a city hardly to be identified as such, so profoundly will it differ from the cities with which we are familiar. Then, when to the advantages of cities, such as good drainage, are superadded the enormous hygienic advantages of the country, we may expect a death-rate not of 18 per 1000 per annum, but half that number.

Then what is to be done with the cities already extant? They were not built in a day; and it will take many decades to renovate them; but there is no reason why the process should not begin to-morrow. Only there must first be developed amongst us what Dr. Clouston calls a "public health conscience." Meanwhile the present conditions will be reproduced. Between the writing and reading of these words many grates will have been put into many new houses all round the growing edge of London. Each of these grates will have been constructed to contribute its *quantum* to next year's "London particulars." Yet sane grates exist. All I would indicate is that elementary hygienic considerations make certain demands, easily formulated and complied with, which might be met from henceforth; thus proceeding with the renovation of London, yet observing strict economy. Of course, the economic question is the great difficulty. People wrongly fancy—despite "compulsory Greek"—that economy is a matter of money. But it really means the "law of the house"; and the true civic economy will concern itself with the laws which should govern the making of cities, as well as with the entirely subsidiary question of financing the city when made.

I indict the modern city, then, on the score of physiology, psychology, and art. If the charges be found proven, we must inquire as to the possibility of sentence. But I have assigned reasons to show that our evils are by no means without remedy. In point of fact, the "Utopian dream" and "Quixotic enterprise" of the typical stick-in-the-mud or conservative of one generation is invariably destined to become the commonplace of the next; and the Garden City is passing through these stages in much less than the average time; whilst the energy and wisdom of a few promise shortly to provide even London with a garden suburb at Hampstead. Fortunately, we shall none of us suffer the humiliation of hearing the abominable conditions in which we live described with due pity and disgust by our successors of a century or two hence.

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THE WASTE OF LABOUR IN OUR CONVICT PRISONS

"DON'T HURRY" IS THE RULE LAID DOWN FOR PRISONERS—£700 A YEAR PAID FOR WEEDING HALF AN ACRE OF GROUND—LOOKING FOR A JOB—MEN HARNESSED TO CARTS—DIGGING INSTEAD OF PLOUGHING—A PLEA FOR BUSINESS PRINCIPLES IN THE CONDUCT OF PRISON WORK

BY

H. J. B. MONTGOMERY

MOST people believe that work is a leading if not the principal *mot d'ordre* in English prisons. The term "hard labour" would certainly seem to emphasise as much, while "penal servitude" insinuates a state of things wherein constant toil is very much in evidence. But although this is the prevalent idea in regard to prisons, convict and local, in this country, the reality is quite otherwise. The most difficult problem in every gaol is how to find work for the inmates; and most prisoners pass their sentences attempting to make their work last out, instead of, as is generally believed, in enforced efforts to increase their output. This fact is largely but not wholly due to the gradually narrowing range of prison labour.

For some reason or other it has been determined that work in prison shall be confined to such forms as do not compete or interfere in any respect with outside labour. Of course, as a matter of fact, it is impossible to find such work, except work done directly for the prison. Originally and until recently mat-making was almost a distinct prison industry. Then mat-makers outside, finding they could not manufacture and sell mats as cheap as the prison-made article, agitated, with the result that mat-making in prison was interdicted by the Prison Commissioners. Precisely the same thing has happened in regard to other kinds of prison labour, until, as I have said, it has come about that, except in regard to work performed for the prison, such as washing, cooking, &c., there is considerable difficulty in finding employment for prisoners. Under such circumstances "hard labour" and "servitude" are surely inappropriate terms. The ordinary prisoner nowadays spends most of his sentence loafing. I believe he would much prefer straightforward work, but how is that work to be obtained which will not interfere with outside labour? I am not aware who is responsible for this economic fad in regard to prison labour. If prisons were private institutions one could understand the objection to unpaid work done by their inmates being brought into competition with similar work paid for at the market rate of wages. But prisons are public establishments, supported by the taxpayers, and under existing conditions they are a very heavy burden on the public funds. They practically produce nothing, and their inmates are in more or less enforced idleness.

In this article I propose especially to refer to convict prisons, in regard to which I may claim to speak with that knowledge which comes from experience. The problem of providing work for over seven hundred men in a convict establishment, such as that at Parkhurst in the Isle of Wight, is a very serious one. Of course a certain proportion of the prisoners can be employed on work directly connected with the prison. There are parties detailed for the cookhouse, the bakery, and the laundry, the shoemakers', the tailors' and the carpenters' shops. It is not necessary, in order that a man should be detailed for any of these parties, that he should possess any knowledge of cooking, baking, and so on. In prison a prisoner is supposed to be able to do anything, without previous knowledge of the work he may be called upon to perform; and although the fact of a man having a trade, if it be known, will probably ensure his being put to work where his knowledge can be utilised, the fact of his having no trade is no obstacle whatever to his being sent, say, to the tailors' party, or to bake bread. Obviously a man who has never had

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a needle in his hand before being sent to prison, is not likely to prove a success at making prison clothes, or even sewing on buttons. The same criticism applies to prisoners employed in the cookhouse, bakehouse, &c.

It is safe to say that of the seven hundred inmates of Parkhurst Convict Prison not 10 per cent. earn sufficient to pay for their food, and not 5 per cent. of them ever do a fair day's work. There is, as a matter of fact, practically no work for prisoners to do. It is nearly all make-believe. For three years I was in Parkhurst in a light labour party, employed outside the prison, and during nearly the whole of that time we were employed, as the warder in charge of the party put it, "in looking for a job." Even when we found that job it was constantly impressed upon us that we must not hurry over it, because if we did there would be nothing for us to do. During the last four or five months of my imprisonment at Parkhurst I was, as a misdemeanant, employed in an enclosure. In that enclosure there is a plot of ground about half an acre in extent; it has not been cultivated for some time. So far as I can learn it is kept fallow in order to produce weeds. The duty of the party to which I belonged was to weed this plot of ground, and by the time we had got to the end of it there was always a fresh crop of weeds at the beginning, that we could commence on anew. We were very careful never to pull any of these weeds up by the roots, because the warder in charge of the party told us that if we got out of this job there was nothing whatever for us to do. I made one day a small calculation as to the cost of weeding this half acre of land by some five-and-twenty men; I put their wages down at a very small amount per diem, much below the market rate; and I arrived at the conclusion that the weeding, the imperfect weeding, of this half acre of ground, cost somewhere about £700 a year.

In Mr. Justin McCarthy's *History of Our Own Times* he relates a fact which he appears to think is somewhat exceptional, namely, that while Mr. Michael Davitt was in Portland Prison it had been part of his work to be harnessed daily to a cart, "as if he were a mule or a horse, and to drag stones this way and that for hour after hour." Now, if Mr. McCarthy made a journey of investigation to Parkhurst he would find some fifty or sixty men harnessed daily to carts. I have seen as many as twenty-two men employed on one cart, pulling and pushing it. This I think would strike any person except a prison official as a great waste of manual labour. There must surely be something radically wrong in a system whereby men who might be earning remunerative sums to pay for the cost of their maintenance are employed in what is not only unremunerative, but extremely degrading work. The amusing part of it all is that these men are not employed in dragging carts about because there are no horses available for the purpose. There are three cart horses maintained in the stables of Parkhurst farm, and these animals are actually taken out to be exercised because there is no work for them to do, while at the same time, as I have said, fifty or sixty prisoners are employed in dragging carts about! Once a month or so there is a great commotion in the farmyard—one of these horses is about to be saddled and placed in a cart; he is going to the hayrick to cart in hay for himself and his companions to eat. That is almost the only work these three quadrupeds perform during the year. Quite evidently they, like prisoners, do not pay for their keep.

A goodly number of the working parties in Parkhurst Prison are employed on "The Farm." This farm consists at the outside of thirty-five acres of land, and the working and management thereof afforded me no little amusement during my stay at Parkhurst. The farm, like everything else in the prison service, is run on the "how not to do it" principle. I should say that, allowing even a moderate sum for the labour employed on or in connection with these thirty-five acres of ground, this farm is worked at a loss of at least £2000 a year. These figures, of course, do not appear on paper. I understand that very elaborate books are kept in connection with the farm, as is likewise the case in reference to every other department of the prison, and that these books show a considerable annual profit. But this profit is arrived at by the simple process of manipulating figures. Prison book-keeping is an art in itself, and to the uninitiated prison books and figures demonstrate clearly that every department in a prison is making enormous profits. Unfortunately these profits are lost somewhere or other—they do not reach the taxpayer, who is, accordingly, called upon to pay up about £600,000 a year, the deficit on the profit-worked prisons.

One extraordinary feature in connection with prison labour and prison finance is that the more men there are employed on any work or in any particular department of the prison, such as the farm, the more profit there is realised. For example, if a store, pigsties

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or anything else has to be built, more profit is made if twenty men are employed on the job than had ten only been employed. This is a reversion of the ordinary experience of life, and it would be difficult to demonstrate this fact to, say, a London builder, but it is a fact nevertheless, as I shall show. For example, suppose, as was the case at Parkhurst a few months before I left, a schoolroom had to be built, and fifteen men were to be employed upon it as masons, bricklayers, and so on. According to prison finance the cost of the building would be worked out somewhat in the following manner:

15 men for 80 working days at, say, 2s. a day per man . .	£120 0 0
Materials, &c., used (estimated value of wood, &c., when fitted for use)	80 0 0
	£200 0 0
Cost of raw material . . .	50 0 0
Profit	£150 0 0

Now it is evident that if instead of fifteen men for eighty days, thirty men for eighty days had been employed on the same building, each man doing less work than would have been the case had only fifteen men been employed, the profit, instead of being £150, would have been £270. It is on this principle that the Parkhurst Prison farm shows so large a profit on paper. I should be afraid to say how many men are employed during the year on or in connection with these miserable thirty-five acres. One party of about twenty-two men is kept at work all the year, reducing bones to dust by the somewhat cumbersome process of crushing them with a hammer. Reckoning the value of the labour of these men at even 1s. a day all the year round, that would represent a sum of about £400 a year for providing bone dust alone for these thirty-five acres. Besides this party, there are about forty other men employed directly on the farm, and a considerable number employed indirectly. These thirty-five acres are under the control of the farm bailiff—a prison warder—whose ideas in regard to farming, as carried into practice, are certainly, to put it mildly, antique.

The farm bailiff at Parkhurst is not a farmer, the "master carpenter" only knows such carpentering as he has picked up from prisoners, the "master printer" has gleaned his knowledge of printing, such as it is, from prisoners. In fact the only individual connected with any trade in Parkhurst who had any practical knowledge thereof before he joined the prison service is the "master tailor," and he graduated in a workhouse. The "master cook" and "master baker" knew nothing of cooking or baking before being appointed to those posts. The Prison Commissioners appear to take a positive delight in placing square men in round holes.

I have mentioned the master printer, and I must not conclude my remarks on the Parkhurst working parties without referring to the establishment presided over by him, a printing and a bookbinding shop, in which from fifty to sixty men are employed printing and binding books for the prison service. Until just before I left, the printing in this establishment was conducted very much as Caxton did his printing, but quite recently a gas engine has arrived, and created no little excitement. Of course this printing and bookbinding establishment is also worked at a large profit—on paper. In my opinion it actually is run at a distinct loss, as any one can imagine would be the case in regard to an establishment of the kind presided over by an amateur, and worked by amateurs. I know a jobbing printer with a couple of men who would turn out more work than do the thirty prisoners employed in the Parkhurst printers' shop. I will not make any comparison as to the respective quality of the work, because any specimens of the Parkhurst printing I have seen convinced me that the work turned out was precisely what might be looked for from amateurs.

In a convict prison the prisoner is not actually at work more than six and a half hours a day in summer, and five and a half in winter; on Saturday he has a half-holiday. But even these meagre hours of labour are not devoted to the nominal work performed. From them must be deducted the time employed in getting to and from the work and various other lost minutes. In the eyes of the prison authorities these minutes are of no importance. The prisoner has eternally preached to him the prison gospel, "Don't hurry," and he doesn't. To make a job last out is the perennial prison programme. The ordinary man in such a prison as Parkhurst, whatever may be his capacities or qualifications in the outer world, very quickly discovers there is no scope for his abilities or energies inside the prison walls. His business there is to loaf. He must dawdle over his work and loiter away his life. In one sense such a state of things is amusing, in another it is incredible. All the time the average prisoner costs the

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country somewhere about £75 a year, and he earns practically nothing. The prison is overrun with officials—there are in all one hundred and fifty at Parkhurst looking after seven hundred men. Many of these officials might very well be replaced by prisoners.

Suppose a manufacturing firm were handed over such an establishment as Parkhurst Convict Prison, and informed that on condition of paying the prison staff, clothing and feeding the prisoners, and providing for the prison up-keep, they might have the services gratuitously of the seven hundred inmates, does any one suppose the firm would show a heavy loss on their year's working? Of course, they would run such a place on very different lines to those that at present obtain. They would most certainly refrain from putting square men in round holes, and they would organise the whole place on a business footing. There does not appear to me any insuperable reason why a Government department should not do likewise. There is no reason, that I can comprehend, why an article, because it is made n prison, should be sold to the public at less than its market value. The outcries against prison labour are too often merely the wails of a few local tradesmen, voiced by their representative in Parliament. I will give an instance in point. A few years ago there was a brick-kiln on the Parkhurst Prison grounds, where bricks required solely for prison purposes were manufactured. In this kiln work was found for a certain number of prisoners; and although I do not suppose that on the lines on which prison work is carried out the output was great, still, as nothing was paid for labour, the bricks were certainly produced cheaper than they could be purchased locally. But the brick vendors of Newport, the neighbouring town, resented the loss of profit involved in their not being permitted to supply the prison with bricks; they successfully agitated against the prison labour unduly interfering with the brick trade; the brick-kiln was abolished, and the prison bricks are now carted from Newport to the prison and paid for at the current local price. This does not appear to me to be sound economy. It seems to my mind to be merely fatuous folly. The object of any sensible system of prison administration ought to be to keep prisoners fully employed during the hours of labour, which certainly should not be less than obtain in the world outside the prison. Prisons exist primarily, if not altogether, for punishment, and work ought decidedly to form a very prominent feature of the punitive element. At the present time, in convict prisons at any rate, from a punitive point of view work may be almost disregarded.

But beyond the question of punishment, there is the important question of economical administration. At the present moment the expenditure of this country is greater than it has ever been; and with the estimates for all the departments of the Crown tending to become more and more inflated year after year, expenditure on any of the public services should be severely scrutinised, and a more economical administration effected where possible. There is ample scope for retrenchment in H.M. Convict Prisons. They ought to be at least self-supporting, and there is no reason save official stupidity why a number of able-bodied men, dieted on coarse food, and arrayed in coarse clothing, should cost about four shillings a day for their maintenance and custody. The reorganisation of labour in convict prisons would at once reduce expenditure, and render those establishments more repulsive to the larrikin and loafer than is at present the case. If each able-bodied convict were employed at least eight hours a day on remunerative labour, the estimates for the convict prison service would very soon show a material diminution. But to effect this desirable consummation, the certain clamour of interested local tradesmen must be disregarded, and labour in the prisons must be organised in the only possible way, namely, by selecting practical men to arrange and control its various forms—men, in fact, who are professionals, not amateurs. Arising out of this reorganised labour, another useful reform might be simultaneously effected—the teaching of useful trades to prisoners who possess none. Many a man on his return to the world after completing his sentence reverts into crime because he does not possess a trade which will at once enable him to obtain employment. An innovation of this kind might, and I believe would, have very useful consequences in solving to some extent the problem of professional crime, of which so much is heard nowadays. Be that as it may, the time has certainly come for a drastic reform in the present conception and organisation of prison labour. Prisons should be what Unions are sometimes called, workhouses, and should be placed much more in evidence than they are to-day. The necessity for a change is imperative, but, as I have attempted to indicate in this article, no proper or effective change is possible until the nonsensical limitations which at present hamper prison labour are abolished.

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THE NEW TRANSPORTER BRIDGE

AN ENTIRELY NEW AND CHEAPER FORM OF BRIDGE SUITED FOR NAVIGABLE WATERWAYS—EXAMPLES ON THE CONTINENT—A DESCRIPTION OF THE TWO NOW BEING BUILT AT WIDNES AND NEWPORT

BY

H. G. ARCHER

BEFORE many months are over the first of an entirely novel form of bridge in this country will be open for traffic, or, rather, at work. The bridge is of the "transporter" type, and is in design precisely similar to an ordinary stiffened suspension bridge, with the exception that the approaches to the bridge are at a low level, thus dispensing with the costly high-level approaches, and the traffic both foot and wheel is carried over in a car suspended to the underside of the bridge.

It is said that the principle of the Transporter Bridge was invented by Mr. Charles Smith of Hartlepool, who designed a structure of this type, about thirty years ago, for crossing the river Tees at Middlesbrough, but it was never constructed, owing to the fear that it would not prove suitable on so exposed a coast where storms might sweep it away. The genesis of the idea, however, can be traced much farther back. In 1836, while the original suspension bridge across the Avon at Clifton was being constructed to Brunel's design, for the purpose of facilitating the works an iron bar was hung across from Clifton Rocks to Leigh Woods, at points lower than the present piers. A basket carrier was suspended to the bar, and was used to convey three or four workmen at a time to and fro. Subsequently, passengers also were permitted to make the novel journey, and were at first charged five shillings a head for the trip; but later only one shilling. This somewhat dangerous contrivance lasted till the abandonment of the original works in 1853.

The first transporter bridge was erected in Spain only thirteen years ago, over the River Nervion, below Bilbao, and between Portugalete and Las Arenas. The towers are 240 ft. in height, and rest on stone platforms, the span between them is 530 ft. long, and the suspension girder is 150 ft. above high-water level. The transporter car, which accommodates two hundred persons, and runs 20 ft. above high-water mark, is propelled by a steam-engine in one of the towers.

The transporter bridge is the simplest and most practical way of crossing rivers. Owing to the great height of the bridge proper from which the car is suspended, ships with the tallest masts may pass under it. Hence it is the best for navigable waterways in which the navigable passage must be left clear. Here its alternative is the movable bridge—bascule, draw, swing, traversing, lift, or pontoon, &c.—which invariably is very costly to construct, maintain and work.

Again, the transporter bridge, from being built on an air line, realises the minimum distance to be crossed. In cases where traffic is not superabundant and economy must be studied, it is therefore the cheapest and most efficient type of bridge building.

The success of the original Spanish structure caused French engineers to take up with the idea, and they have built *ponts transbordeur* at Rouen, Bizerta, and Nantes. The Rouen bridge, over the Seine, has towers 221 ft. in height, and a span of 467 ft., while the distance from the flying-bridge to the ground level is 164 ft. The suspended car is 41½ ft. long, and 36 ft. wide. It is hung by thirty steel cables, 140 ft. in length, to a heavy traveller, which runs on the top platform on four lines of rails, being carried on no fewer than sixty small wheels arranged in pairs. Here it should be explained that the cables suspending the car are always double the number actually required, so that if one should break, the car would still run whilst it was being repaired, and are set at a tangent to prevent either side or end oscillation of the car in windy weather. Then, of course, the operator, who is located in a little conning tower in the centre of the car, has the latter completely under his control. He can thus reverse, go-ahead, or apply the brakes at a moment's notice. With the Rouen transporter, which was opened in the spring of 1900, the motive power is electricity. The car accommodates about three hundred passengers in glass shelters at each side, while the central part is reserved for vehicles. The journey from quay to quay occupies fifty-five seconds.

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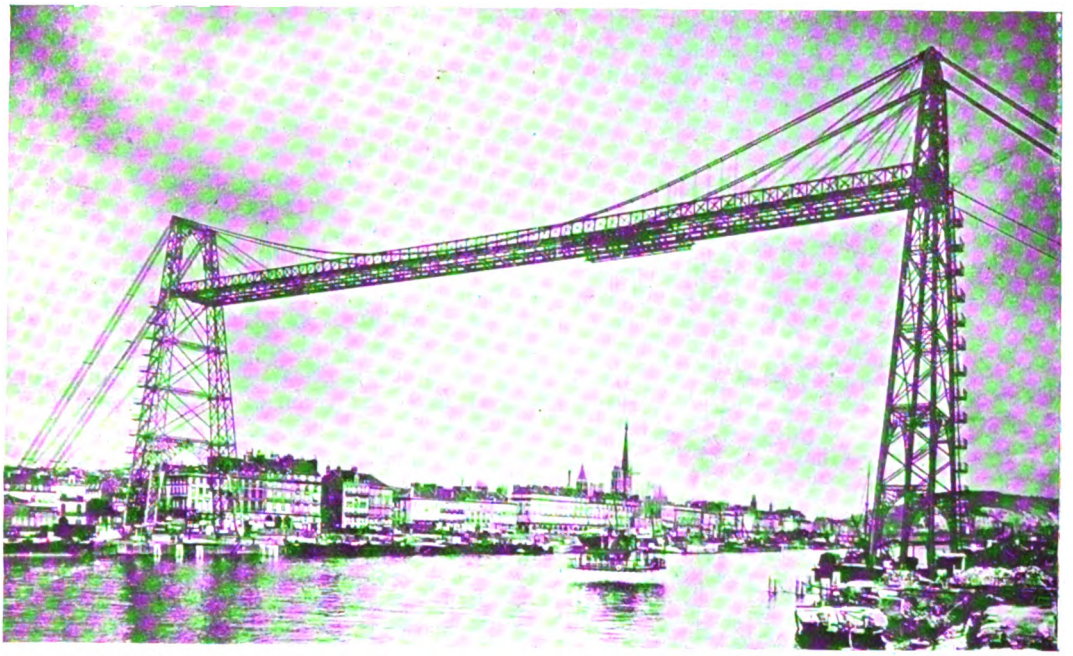

Topical Press

THE ROUEN BRIDGE, VERY SIMILAR TO THE ONE BEING ERECTED AT NEWPORT, MON.

H. G. Archer

THE WIDNES AND RUNCORN TRANSPORTER BRIDGE—CROSSING THE MERSEY AND THE MANCHESTER SHIP CANAL

By a coincidence, the new bridge is on exactly the same site as was to be occupied by the suspension bridge proposed by Thomas Telford in the year 1817, and is of the same span, namely, 1000 ft. between the towers

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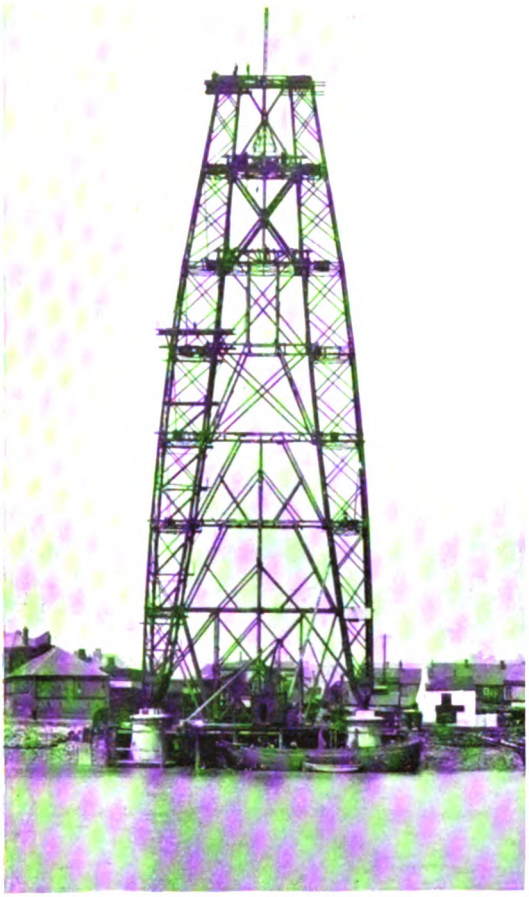

A TOWER OF THE NEW BRIDGE AT NEWPORT, MON.

The Bizerta bridge crosses the broad canal connecting the outer with the inner harbour. The towers are 148 ft. high, and the span is 500 ft.

The Nantes *pont transbordeur*, which was completed a few months ago, has steel towers 190 ft. in height, a span of 490 ft., and a suspension bridge, 165 ft. above the surface of the water. The car, which is operated by electric motive power, carries foot passengers, vehicles, and railway cars, being equipped with lines of way for the last-named purpose.

Two transporter bridges are being erected in this country. One of them, the Runcorn and Widnes transporter bridge, is nearing completion. It will cross over both the Mersey and the Manchester Ship Canal at Runcorn Gap, which is a contraction of the Mersey to a width of about 1200 ft. at high water. A company for building this bridge was incorporated by Act of Parliament in 1900. The engineers are Mr. John J. Webster, M.I.C.E., and Mr. John T. Wood, M.I.C.E.

A bridge is sorely needed between the points in question. Runcorn and Widnes are important manufacturing towns, and at present there is no access beyond the bridge at Warrington and the ferries at Liverpool, both some miles distant, and a footbridge only alongside the London and North Western Company's Runcorn railway bridge. The steel towers of the new bridge rise 190 ft. above high-water level; and the height of the underside of the two longitudinal stiffening girders, which are 18 ft. deep and placed 35 ft. apart horizontally, is 82 ft. above high-water level. The clear span between the towers, 1000 ft., is the longest span of any bridge in the United Kingdom designed for carrying road traffic. Each of the two main cables from which the bridge is suspended is 12 ins. in diameter, and consists of nineteen steel ropes bound together. The ends of the cable backstays are anchored into the solid rock about 30 ft. from the rock surface. The weight of the steel cables is 243 tons, and the wire is capable of withstanding a tensile stress of 95 tons per square inch.

The transporter car will consist of a platform 55 ft. long by 24 ft. wide, with accommodation for three hundred passengers, and four two-horse vehicles. The bottom of the car will be about 12 ft. above high-water level, and will clear the Ship Canal wall with 4½ ft. to spare. The trolley or traveller, from which the car is suspended, will run upon rails on the lower flange of the stiffening girders, placed 35 ft. apart. The trolley is 79 ft. long, and is carried by sixteen wheels on each rail. It is propelled by two electric motors of 35 b.h.p. each, which are fixed to a kind of bogie arrangement in the trolley, so that in the case of large curvature of the bottom boom of the stiffening girders, caused by either temperature or load, the driving wheels will be certain to bite the rails firmly. It should be added that, in order to allow for longitudinal expansion and contraction, the girders are fixed to vertical rollers, a unique arrangement. The time occupied by the car in crossing will be about 2¼ minutes.

The second English transporter bridge is being built over the River Usk at Newport, Monmouthshire. This is a municipal enterprise. The Newport bridge is very similar in design to that at Rouen, but there will not

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be an ounce of foreign material in it. The contractor is Mr. Alfred Thorne, of Westminster, and the engineer is Mr. Robert H. Haynes, the engineer of the County Borough of Newport, who has made a special study of transporter bridges. The steel towers will be 250 ft. in height above the river banks, and the clear span between their centres, 685 ft. The suspended bridge will be 170 ft. above high-water mark. Electricity is being extensively used in the erection of the bridge, and has been attended by satisfactory results. For example, the total weight of steel work in a tower is about 277 tons, and in addition to that there are about 100 to 150 tons of timber employed in staging and scaffolding. The actual expenditure of current for lifting the whole of this material is only 616 in Board of Trade units. The car will carry about four hundred passengers and will effect the passage in one minute, the motive power being electricity. With the foreign bridges the car, while at rest, projects into the river, but the cars of the Newport and Runcorn bridges will run into a special dock in the leg of each tower.

The estimated total cost of the Runcorn and Widnes bridge, including parliamentary expenses, is about £130,000; and that of the Newport transporter £70,000. In each case an ordinary high level or dry type of movable bridge would have cost at least three times the amount.

The approaches to these bridges will be illuminated with electric light, and fog signals and bells are to be sounded when necessary. The one and only objection urged against the transporter type of bridge is that, although the operator has a full view of the course and the car under his perfect control, by means of both hand and automatic brakes, sooner or later the inevitable will happen, namely, a collision between the car and a passing ship. In the annals of these bridges there has been one accident of this kind. A steamer ran into the car of the Spanish transporter whilst in transit. The vessel was severely damaged, but the equilibrium of the car was not upset, and the passengers escaped with a shaking, while the injury suffered by the car itself did not amount to more than £15 or £16.

THE CAR OF THE BILBAO BRIDGE APPROACHING THE DOCK

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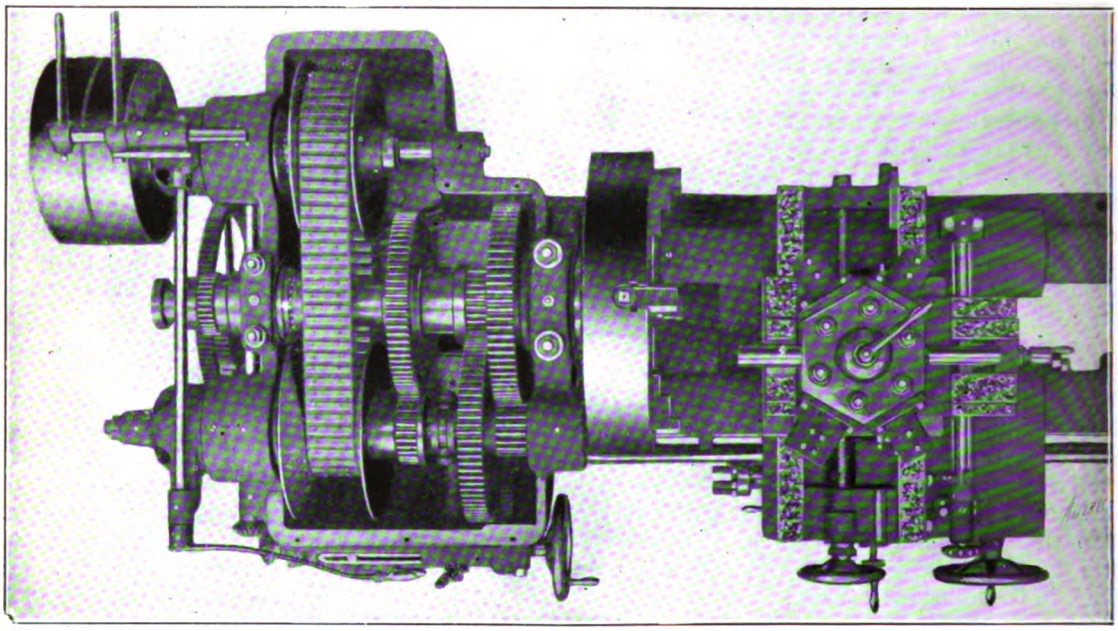
THE GEARING OF A NOVEL LATHE

This photograph, taken from above, gives a plan of the gearing of a surfacing and boring lathe in which the old-fashioned step cones for driving are eliminated. It will be seen that it also has a hexagonal turret for carrying six tools if desired. (John Lang and Sons, Johnstone, N.B.)



MACHINE TOOL PROGRESS IN GREAT BRITAIN

THE INFLUX OF FOREIGN TOOLS DURING THE STRIKE—TRIED AND FOUND WANTING—THE INFLUENCE OF FOREIGN TOOLS UPON BRITISH DESIGN—ANGLO-AMERICAN TOOLS—HOW THE BRITISH TOOL-MAKERS HAVE GOT AHEAD—HIGH-SPEED TOOL STEELS—PRESENT POSITION

BY

S. G. HOBSON

[OF "THE IRON AGE"]

FIRST ARTICLE

THERE has been no more dominant factor in the industrial progress of the last decade or two than the machine tool. By machine tool (so far as this article is concerned) I mean a machine which is employed in the making of another machine or some other part of the industrial armament of to-day. Generally, the engineer confines the definition "machine tool" to the various machines which he employs for turning and boring metal, for example, the lathe and boring mill; to machines for drilling, slotting, shaping, planing, and otherwise operating on engineering material, including the various cutting, punching, and shearing tools attached to and forming a portion of the same. To the industrial historian, however, "machine tool" means a great deal more. He would probably include the ponderous steam hammer employed in pounding the big engine-shaft into a homogeneous mass of steel, the powerful hydraulic flanging or forging press capable of exerting a

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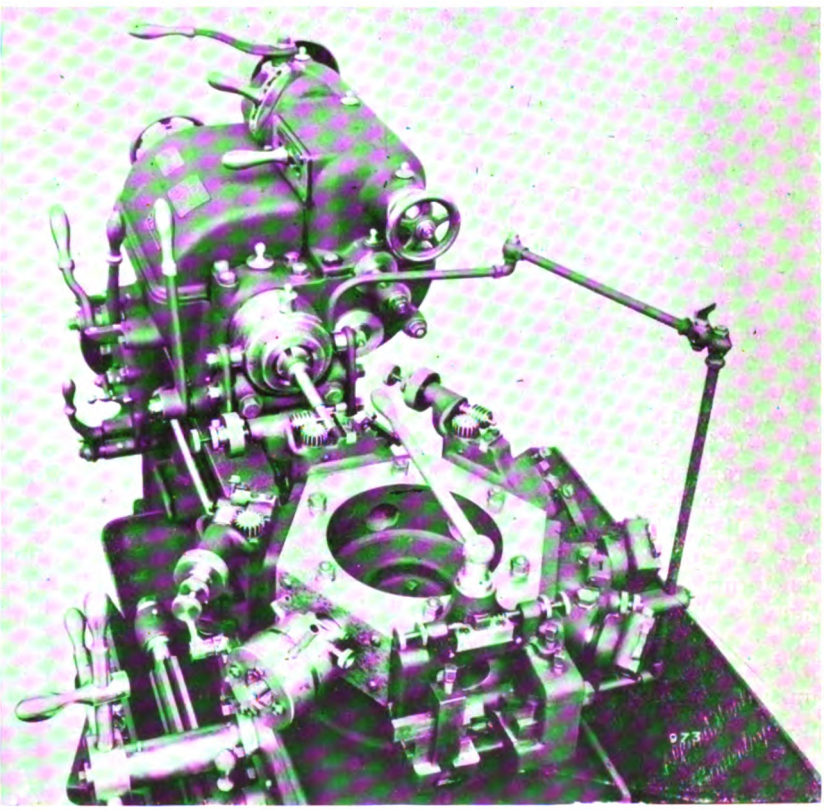
pressure of several hundreds of tons to the square inch and of "dishing" a plate of steel an inch thick as easily as a housewife moulds the dough for her pie-crust. In his definition he would also embrace the little revolver-like pneumatic hammer driven by compressed air which, with its rapidly delivered blows, now finds so wide a sphere of usefulness in the engineering establishment. He would likewise include the cold saw which cuts through a chunk of steel with as much ease as the cheesemonger divides a cheddar with his wire, and the disc-grinder, which has practically superseded the file. In fact, all machines, from the little lathe which turns out the tiny screws and wheels forming the components of the smallest gold watch to the tool which "turns" the shaft of a Cunarder or bores the cylinder of a locomotive, are to all intents and purposes "machine tools." It is, however, not the purpose of the present article to catalogue and classify what machines may be regarded as "machine tools," but to glance at the progress which they have been enabled to make in industry. This much may, however, be said to show that I need offer no apology for referring to some machines which are not strictly included in the term "machine tools" as understood by the engineer.

From this it will be gathered that, although the development of the machine tool during recent years has given a spurt to industry, the machine tool is itself no new thing. Nasmyth with his steam hammer, Maudslay with his curious looking lathes, were pioneers in the machine tool movement as we now know it, but we owe most perhaps to Sir Joseph Whitworth, who pointed out that "the prosperity of England depends not only upon the produce of her soil and mines, but also greatly upon the number of self-acting machines she keeps at work, and in proportion to the increase in the latter will be her increase in wealth and power."

Mention of these names of the godfathers of the machine tool is a sufficient guarantee that substantiality and permanence were among the leading characteristics of the early machine tools. Probably the locomotive has called into existence more special tools than any other machine which England manufactures, excepting perhaps now the electrical, cycle, and motor trades. In the works of some of our leading railway companies tools designed and erected half a century ago are still to be found performing their daily task to the satisfaction of all concerned. In such machines one characteristic of British workmanship and material is illustrated. There was no idea then of making a tool, as the Americans do, with the intention of relegating it to the scrap heap a year or two after. With the exception of parts, which, in the nature of things, must wear out, such tools are as good to-day as they were half a century ago, and will be as good in half a century's



A LATHE WHICH DISPENSES WITH BELTING

Here is a perspective view of the turret and driving mechanism (known as a "geared headstock") of a lathe which dispenses with belting and all overhead complications in driving. (Alfred Herbert, Ltd., Coventry.)

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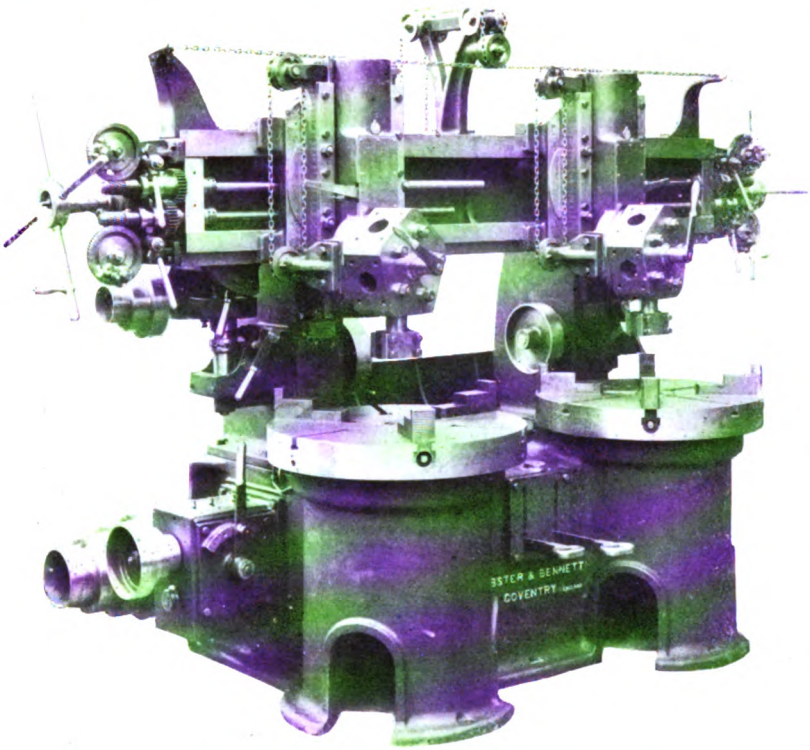

A NEW DEVELOPMENT IN VERTICAL BORING AND TURNING MILLS

It is a duplex machine, and one attendant can keep two tools going at one time, against one on the old type of machine. (Webster and Bennett, Coventry.)

time. Many such tools have, however, been modernised. They have been arranged to run at greater speeds and to take deeper cuts, and have had added to them many little fitments in the way of rigs and jigs. These are, however, only changes in fashion or attire. The body of the machine which wears them is the same.

Undoubtedly the industrial crisis brought about by the historic engineering strike of 1897–1898 was largely responsible for the rapid acceleration in the development of the machine tool towards the end of the nineties. Some of us well remember how for about six months many shops were practically closed. Engineering firms were unable to execute their orders, and bought tools from America and the Continent to enable them to do so. They soon saw that the more extensive employment of the machine tool would render them more independent of the "human factor," and the Americans and Germans, as I shall show in a subsequent article, reaped a rich, if temporary, harvest. Some of the American tools were marvels of ingenuity, but were not easily naturalised. Like exotics, they would not stand the transplanting into a more exacting soil. But British toolmakers, although conservative in their ideas, were not slow to recognise that the newcomers offered exceptional facilities for saving labour and consequently reducing the cost of production. It was not long before they were building Anglo-American tools, incorporating the best features of foreign machines, while avoiding their faults. The result was, not the production of a hybrid, but the production of an acclimatised and hardy variety of the same species.

While, however, in recent years the sphere of usefulness of machine tools has been immensely extended, the work of the individual tool has been limited. Fewer operations are now required to be performed on individual tools. At one time the equipment of many shops did not extend beyond different sizes of lathes, drills, shapers, and planers, and all work performed had to be done on one or another of these, whether it was adapted to the job or not. Now the shaping and planing tools are supplemented, if not in some cases entirely superseded, by vertical and horizontal milling machines, and the tool which had the most encyclopædic function, the lathe, is kept for lathe work proper, boring, polishing, grinding, and so on being performed more economically and efficiently on machines specially designed and kept solely for such uses. The United States have to be credited with the idea of the milling machine and boring and turning mill. By superseding the shaper and planer the milling machine has revolutionised practice in the machine shop, and the vertical and horizontal boring machines stand in the same relation to the lathe. It is claimed that they give an advantage of six to one as compared with the ordinary self-acting surfacing lathe for doing certain classes of work. The Americans sent them over, and we have remodelled and adapted them, and now they are being made

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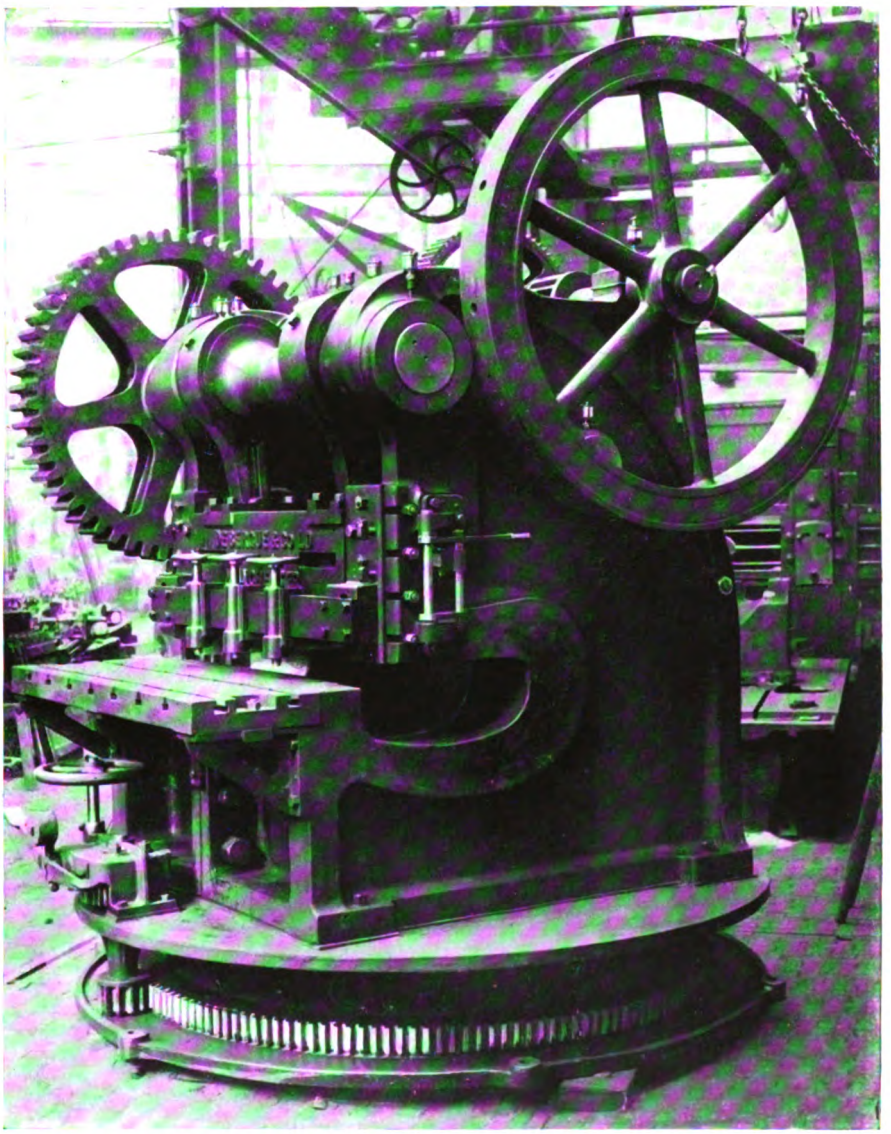
by a dozen British firms on improved principles and of a more permanent and enduring type.

While speaking of newcomers among machine tools, I must not omit mention of the turret lathe, which has met with such a large demand during recent years. Not only is it a new type of tool, but, since it was first given us, unlike the ordinary lathe, great additions have been made to the scope of its operations. Originally employed in making small screws from a rod or bar of metal, this machine has now become one of the most important of labour-saving tools for larger and more pretentious work. It has now relieved the ordinary lathe of a great many of its jobs, which it performs in less time and consequently at a less cost than its simpler progenitor. To the visitor to one of our leading engineering establishments the working of the automatic or semi-automatic tool is a miracle and a mystery. He sees at one end a long rod of brass or steel being slowly drawn in by a machine having a little revolving turret, each side of which contains a differently shaped tool, and which, in proper order and timed to a second, is brought to bear on the material. While he is looking at the tools working on the bar, there is a click, and a bright little nut or screw drops down under the machine warm as a new-laid egg, and the turret has started on another revolution and the production of another screw or nut. And so the automatic tool keeps to its appointed task day after day and year after year. Practically the only human attention it requires is the provision of a fresh rod of material when necessary.

The reader will probably ask what the moral effect of the automatic or semi-automatic tool is upon the machinists. By "machinist" I mean, in the sense generally understood by



A POWERFUL MACHINE FOR SHEARING IRON AND STEEL PLATES

It cuts iron and steel plates with as much ease as a bit of cardboard may be divided with scissors. A feature is that it is mounted on a turntable and can therefore be turned round to any position desired. (De Bergue and Co., Ltd., Manchester.)

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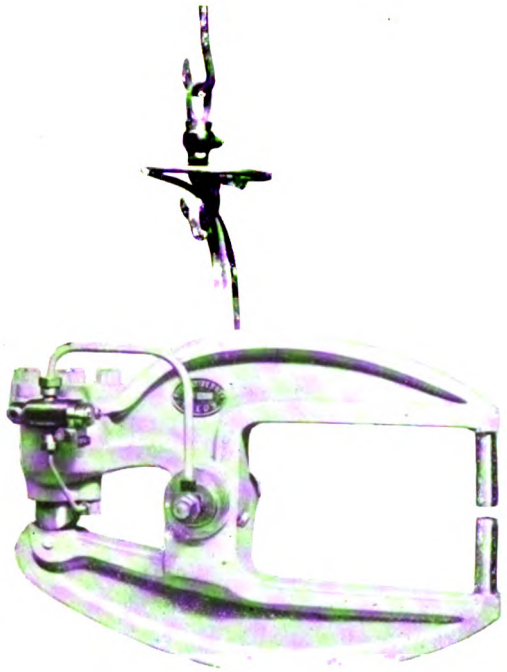

A PORTABLE HYDRAULIC RIVETTER

Of the hinged type. It is used *in situ* for closing rivets in girders, bridges, ships, &c. (Hy. Berry and Co., Ltd., Croydon Works, Leeds.)

engineers, the type of workmen who form a class distinct from the men who do the fitting and erecting of the parts when a job is ready for assembling. Such men, I should add, are not generally apprenticed, but are recruited from the ranks of the unskilled labourers and receive wages fixed midway between those of a labourer and those of a mechanic. Now that work is specialised and there is so much division of labour, naturally, one man is kept to one job as far as is possible. This point is very pertinently touched upon in a pamphlet recently issued by one of the foremost makers of turret lathes. It is pointed out that one of the advantages of the turret lathe, particularly of the automatic type, is its power of relieving the operator of the purely mechanical part of the work. It is admitted that men and boys who are making the same thing (termed "repetition work") all day and every day are not far removed from machines. The articles they make are generally very small and rapidly produced, and the endless cycle of the same movements on the part of the operator is very tedious to watch and must be infinitely more so to perform. Such an occupation is not elevating, and the man, unless he has a soul above it, is never fitted for anything better. When the work is done on an automatic lathe, the machine performs the necessary operations and the man supplies the intelligence, and, by exercising his thinking powers, becomes a more valuable worker. The introduction of new machines and new methods may, however, be made to have quite a stimulating effect on the whole shop by the exercise of discretion and forethought, and it is a striking and significant fact that some of our most modernly equipped shops contain the best men. They disprove the suggestion that men are degraded by the use of machines that do all but think.

Another species of tool which has come very prominently and rapidly to the front during recent years is the grinder, which has dispensed with the file for finishing many descriptions of work. Originally grinding was employed exclusively upon round work, such as shafts, spindles, rollers, &c. Grinding machines for this class of work are still largely employed—indeed, so largely that some engineers are beginning to wonder how they managed to get along without them in the past. It is certain they could not in these days, when such extreme accuracy of work is expected and when costs of production have to be cut very fine. This revolution in methods of finishing circular work, coupled with wrinkles learned from America in the matter of using emery, soon set wideawake men inquiring whether it was not possible to finish flat and irregularly shaped articles in the same way instead of in a vice by means of a file. The result was seen in what is known as a "disc surface grinder," the essential part of which is a rapidly revolving steel disc coated with a special abrasive and which is run at an extremely high speed. The scope of the disc-grinder has been, since its introduction, considerably enlarged, and it now performs work of every conceivable description, formerly done upon milling and shaping machines or by means of the file. Its introduction has naturally reduced the hand work of the fitter and has meant in some shops the almost total elimination of the scraper and file.

I have shown earlier in this article how one lathe has been gradually relieved of a great deal of work formerly put upon it. But while this has been the case, on the one hand, other special tools have come into existence which will satisfactorily perform quite a number of services. Tool-makers, however, are fully alive to the fact that this is a principle which needs to be very carefully watched. There are very few tools indeed that can be designed, like Goldsmith's chest, a "double debt to pay,"

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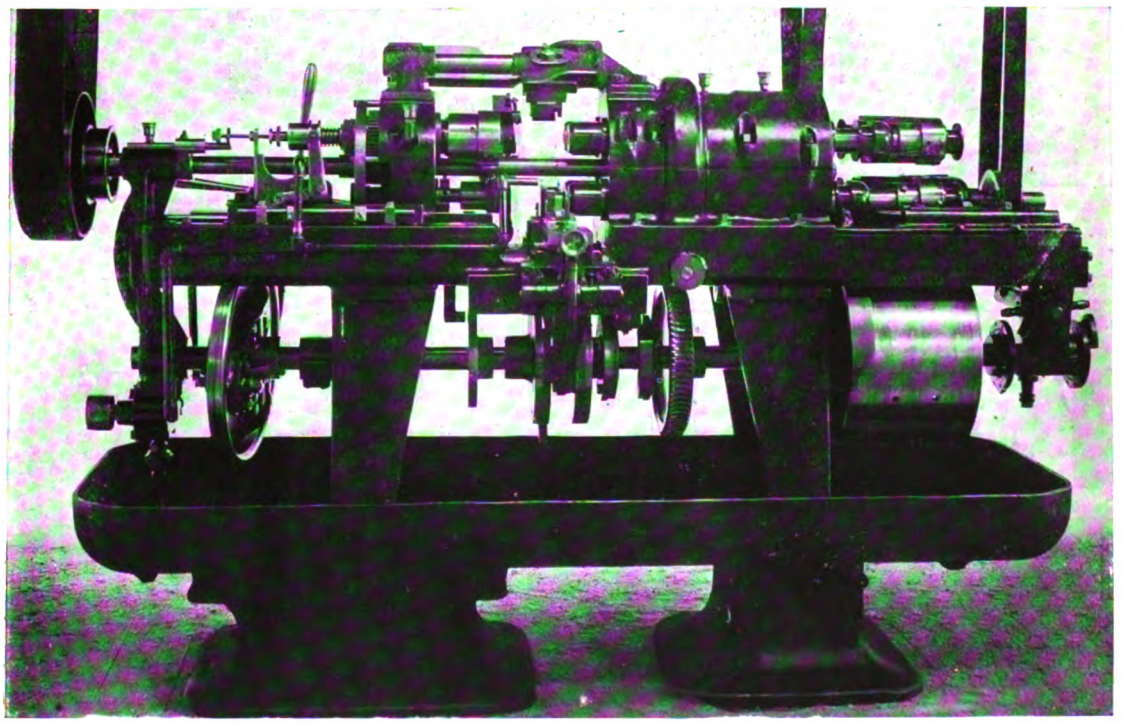
and become "a bed by night, a chest of drawers by day," or, like a school-boy's pocket-knife, a knife, screwdriver, a corkscrew, and almost any number of other tools at will. Grown-up people keep a knife for knife-work, and employ a corkscrew independently when required, and find that each serves better by being kept solely for its own purpose. At the same time, there are some combination tools not intended solely for the colonies or for small shops. One of such is seen in what is known as the combined horizontal drilling, boring, and milling machine.

One of our illustrations is especially interesting in that it shows a plan of a lathe—one of the machine tools which will never be entirely superseded—in the design of which the step cone has been quite eliminated for driving purposes. The introduction of this plan of driving, by a Scottish firm, marked a new era in methods of driving lathes without the attendant awkward countershafts and belting. Another feature of this arrangement is that the driving is so arranged that it is automatically varied as required by the nature or character of work being done, so as to keep the surface cutting speed practically constant. It may be mentioned also that this lathe has a new type of bed, which is protected from injury by the cuttings—a point usually lost sight of by makers.

As I have said, we got our ideas for most of these ingenious tools from America. We are, however, getting very few of them from there now, for British makers have learnt their lesson and have risen to the occasion in a surprisingly able manner. That the best American tools still find a good market in Great Britain may readily be admitted, but British makers are keeping in the forefront. In the next article I shall show how they have accomplished this, and point out how the Germans and Americans have failed though they gave us the lead. To no small extent have we been enabled to do this through the introduction of what is known as "high-speed" steel. These steels were first shown in actual use at the Paris Exhibition of 1900, but in the comparatively few years that have elapsed since then British steel-makers, in keeping with their reputation, have outdistanced the whole world as specialists in the production of tool-steel, and the machine tool-builders have responded to the demand for exceptionally powerful tools for cutting metals at high speeds in a way that has shown that the Britisher has an abundance of life in him yet.



ONE OF THE LATEST AUTOMATIC LATHES OF THE CLASS KNOWN AS SCREW-MACHINES

It is named the "Simplex," and has four spindles in place of one on the ordinary type. (Acme Lathe and Products Co., Ltd., Trafford Park, Manchester.)

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EXCAVATING AT HIGH TEMPERATURE IN THE GREAT ALPINE TUNNEL

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THE WORLD'S LONGEST TUNNEL

THE BORING OF THE SIMPLON—A GIGANTIC TASK COMPLETED—THE ENGINEERING PROBLEMS AND HOW THEY WERE SURMOUNTED

With Illustrations now published for the first time

KING EDWARD was faithfully reflecting the admiration with which British engineers regard a great work magnificently carried out, when he telegraphed his congratulations to the King of Italy and the President of the Swiss Confederation within an hour or two of the piercing of the Simplon Tunnel at 7.20 on the morning of February 24. At that hour the workmen who had been boring through the Alps from the Swiss end, met those who had pierced the rocks from the Italian end. The more than twelve miles of persistent burrowing had been at last accomplished; the heroic labour of six and a half years had met with its reward.

"The most splendidly arranged work of the kind that has ever been done," is how an eminent English engineer described the Simplon to the present writer the other day. Throughout the whole period the measurements origin-

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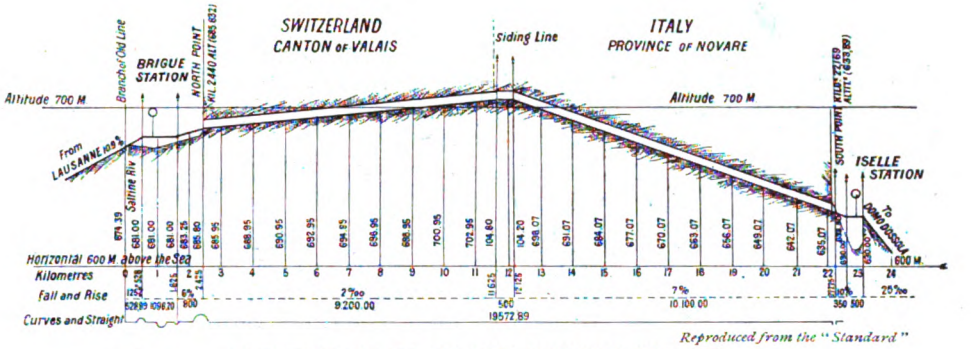

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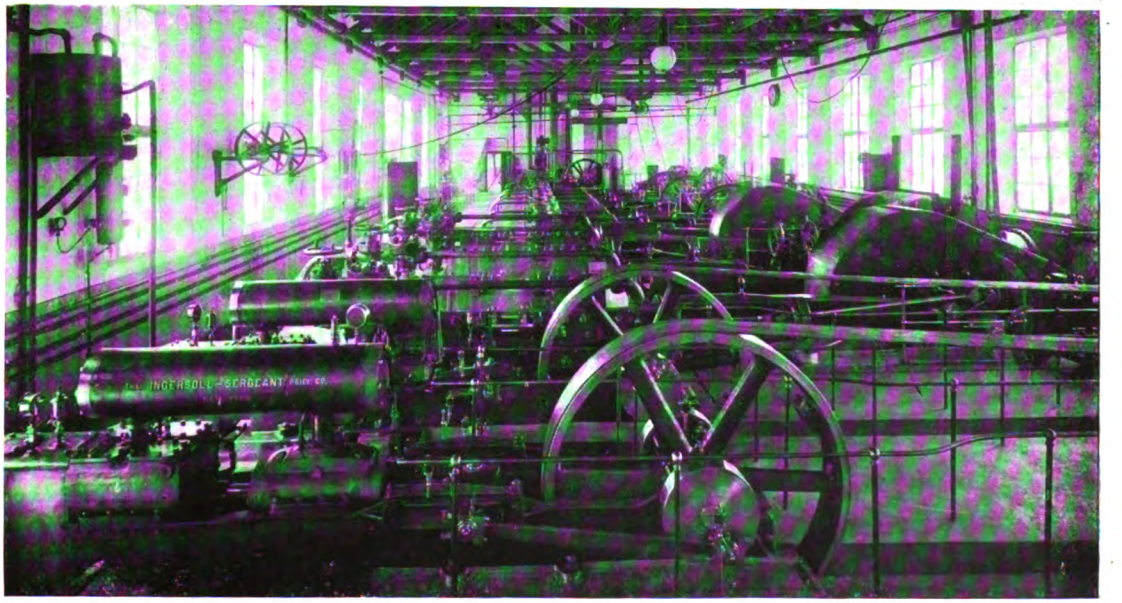
ROUGH DIAGRAM OF THE SIMPLON TUNNEL

ally laid down have not varied. The levels are as accurate at the close of the task as they were intended to be. The treatment of the men, and the excellent ventilation by which they were successfully secured against the dread disease of miner's phthisis, has been beyond all praise *; and the reports of racial jealousy among the various gangs of employees during the progress of the work had singularly little foundation in fact. Every one of the 3000 men worked with a will, having steadily in view the common triumph which has now been won. Difficulties and dangers abounded in the undertaking, but they were met with an amount of ingenuity and courage on the part of the engineers that could not have been surpassed.

Of these difficulties the first was naturally due to the length of the tunnel. This is 12¼ miles, as compared with the 9½ of the St. Gothard tunnel, the 7½ of the Mont Cenis, the 6⅛ of the Arlberg, and the nearly 4½ miles of our own Severn tunnel. In certain places also the Simplon rocks were soft and treacherous. Next, the height of the mountains—the average height of the ridge above the tunnel is 5000 ft., the maximum being 7005—supplied difficult

* "The men on emerging from their work, wet through and fatigued, are not allowed to go from the warm headings into the cold Alpine air outside, but pass into a large building which is suitably warmed, and where they change their mining clothes and are provided with hot and cold douche baths. They put on warm, dry clothes, and can obtain excellent food at a moderate cost before returning to their homes. Their wet and dirty mining clothes are taken charge of by appointed custodians, who dry and clean them ready for the morrow's work. These and other precautions have reduced the death-rate to a very great extent."—From *River, Road, and Rail*, by Francis Fox (Murray, 1904).



THE HIGH-PRESSURE PUMP HOUSE AT BRIGUE

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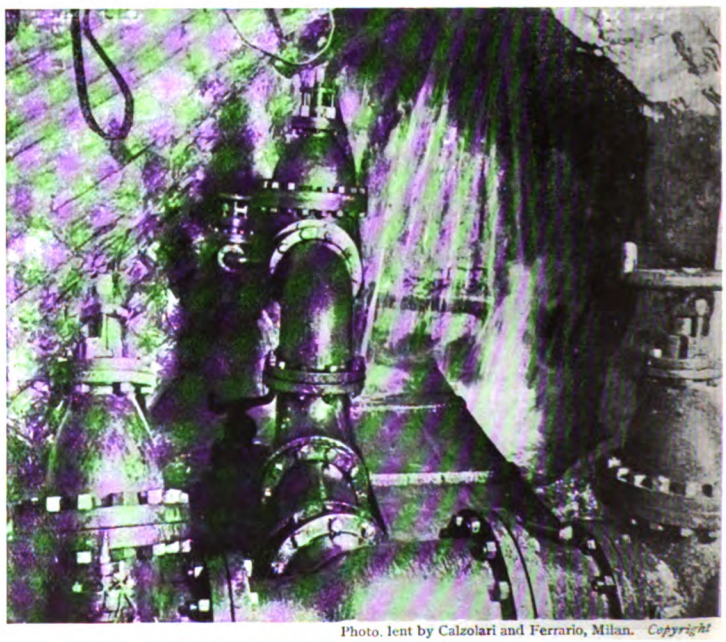
SHOWING THE VENTILATION PIPE (ON THE LEFT)

An abundant supply of air was sent into the tunnel. It was kept cool by fine jets of water and sprays

problems connected with ventilation and temperature, for this was the greatest depth at which men have ever been below ground. These problems were complicated when hot springs were tapped during the progress of excavation. Geologists estimate that a height of 7000 ft. should correspond to a rock temperature of 104° to 107° Fahr., and when it is remembered that in the case of the St. Gothard tunnel the work was carried on with difficulty at a rock temperature of 86° Fahr. the unprecedented nature of the Simplon is apparent. When it was proposed in 1893, some experts said it could not be done. Thereupon, the Swiss Government asked the Governments of Italy, Austria, and Great Britain each to nominate a tunnel expert to examine the plans and report. On this Commission of three, Great Britain's distinguished representative was Mr. Francis Fox, a member of the well-known firm of Sir Douglas Fox and Partners of Westminster. Mr. Fox's colleagues in the conference which took place at Berne in 1894 were Hon. Guiseppe Colombo, member of the Italian Senate, and Herr C. J. Wagner, the latter of whom built the Arlberg tunnel. They reported fully and favourably, and, in due course, a treaty was entered into between the Governments of Switzerland and Italy authorising the construction of the tunnel.

It was to be hard continuous work, night and day. A beginning was made in August 1898, at Brigue, in Switzerland, and a month or two later at Iselle, in Northern Italy. The contractors were Messrs. Brandt, Braudau, and Co., and among other engineers associated in the work were Herr E. Sulzer, of Sulzer Brothers, Winterthur; Col. E. Locher-Freuler of Zurich; Herr Pressel, and Baron Herr Hugo von Kager. Two tunnels were proceeded with simultaneously, parallel with each other, and at 55 ft. centres. Each is for a single line of rails, but only one has been arched at present. The other, a heading 10 ft. wide and 7 ft. high, was for construction and ventilation purposes, but it too will



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COLD WATER TAKEN FROM THE SPRINGS

In cross-gallery xxi

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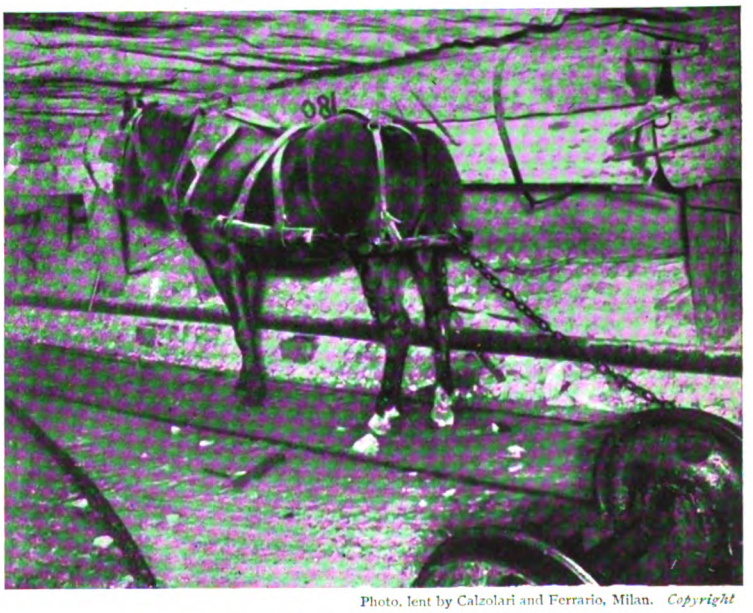
THE IRON ARCHES FOR THE TUNNEL

be completed, and used as a second tunnel when growing traffic requires it.

Working in three gangs of eight hours, no man laying down his tools till the next to come on was ready to take them up, the men made rapid progress with the boring. The speedy execution was due in great measure to the use of the hydraulic drill invented by the late Mr. Brandt, by which for months together as much as eighteen lineal feet of gallery were bored in the twenty-four hours—a record in tunnel engineering. This drill, whose working may be roughly likened to that of the cheese scoop, is not attended by the dust which was so great a hindrance in appliances of an earlier period, as the exhaust water from the drill at once turns any dust into mud. The Mont Cenis tunnel took thirteen years to carry out; the St. Gothard ten years; while the Simplon, though longer than either, has taken less than seven.

"The main tunnel," to quote from a writer in *Engineering*, "is 14 ft. 9 in. wide at the rail-level, and 16 ft. 4 in. wide at a height of 6 ft. 6 in. above the rails. The height of key-stone from the rail-level is 18 ft., the arch being elliptical in all cases, and the total area of section 250 square feet." A considerable part of the tunnel has been lined with quarry stone, the thickness, of course, depending upon the lateral and vertical pressure, the maximum lining of the arch being in the worst places over 6 ft. in thickness. "The heading for ventilating purposes, which is known as No. 2 Tunnel, has only a section of 86 square feet, the cross galleries connecting the two tunnels being of corresponding section. At mid-distance the section of the main tunnel is considerably increased in width to form a turn-out 1310 ft. long, to allow north and south-bound trains to pass each other. To this mid-distance point the tunnel is constructed on an easy gradient from each terminus, the ruling gradient on the north side being 2 per thousand, and on the south side 7 per thousand. The practice was to make an advance heading 7 ft. 10½ in. in height, and of a width of 10 ft. 8 in. for the passage of metre-gauge compressed-air locomotives with trains of trucks, these headings being subsequently opened out to the complete section for the main tunnel No. 1. The drilling-



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THE ENTRANCE OF A CROSS-GALLERY

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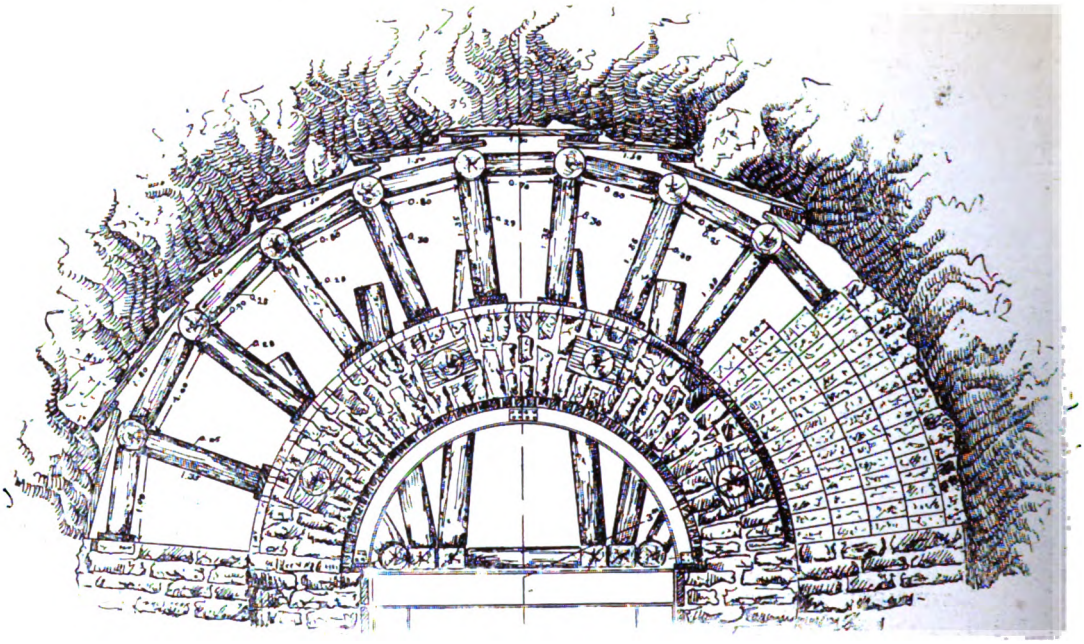

ARCHING THE TUNNEL

Only the partly built division of granite archway seen on the right next the rock is permanent in this structure. This once completed, all the temporary supports were removed

SHOWING HOW THE TIMBER AND STEEL BUCKLED UNDER THE PRESSURE OF THE ROCK

Steel fortified with concrete and cement was finally adopted, and held

machines and other tools used were splendid pieces of mechanical design. The machine was run on the narrow-gauge track, and the multiple drills were operated by hydraulic power of a pressure of 99 atmospheres, the pipes being laid through the heading No. 2. As a rule, eight blast-holes were made in the face for the heading, and these were drilled fan-shape to a depth of about 6 ft. The machine was then run back to a refuge 200 yards to the rear of the works, and a collective charge of 90 lbs. of gelatine was used in the eight holes to loosen the rock, which was subsequently loaded by hand and removed by the train of trucks. The floor of the heading at the face was laid with light iron plates to facilitate the shovelling of the broken rock."

As the gradient of the tunnel

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rises up from each side to the middle, where there is a level, the yield of the great springs which were met with flows away by gravitation. At 4400 mètres from the Italian entrance a large spring of cold water of 12,500 gallons per minute was struck, and caused several months' delay. An engineer connected with the work, writing in the *Times*, states that the "ground" here was very treacherous and had to be heavily timbered. The stoutest and largest timbers were crushed, and steel girders had to take their place; but so great was the weight that these in turn were twisted and distorted (as will be seen in one of our illustrations), and finally were only held in their place by being strengthened with concrete in cement. "This enabled the driving of the gallery to proceed, but meanwhile," continues the engineer, "the Brigue end had reached the top of the gradient in the middle of the tunnel, although the rock temperature had risen to 132° Fahr., fully 25° more than had been expected. With a view to saving time, it was then decided to continue this and drive down the Italian gradient to meet the corresponding tunnel coming up from Iselle, although it was quite anticipated that difficulties would be met with in driving downhill. In this the contractors were not deceived, for very soon hot springs of 117° Fahr. and of considerable volume were met with. These springs are far hotter than is bearable, but the engineers adopted the comparatively simple expedient of throwing jets of cold water into the fissures and thus reducing the temperature as far as was necessary. The cold water is driven into the tunnel by centrifugal pumps, through pipes surrounded by non-conducting material, so that the water is delivered as cool

THE VILLAGE OF ISELLE, AT THE ITALIAN END OF THE SIMPLON

To connect the tunnel with the existing railway at Domo d'Ossola heavy work was necessary, including one helical tunnel. No such expensive work was required at the other end, as the tunnel enters the mountain at the present level of the railway at Brigue

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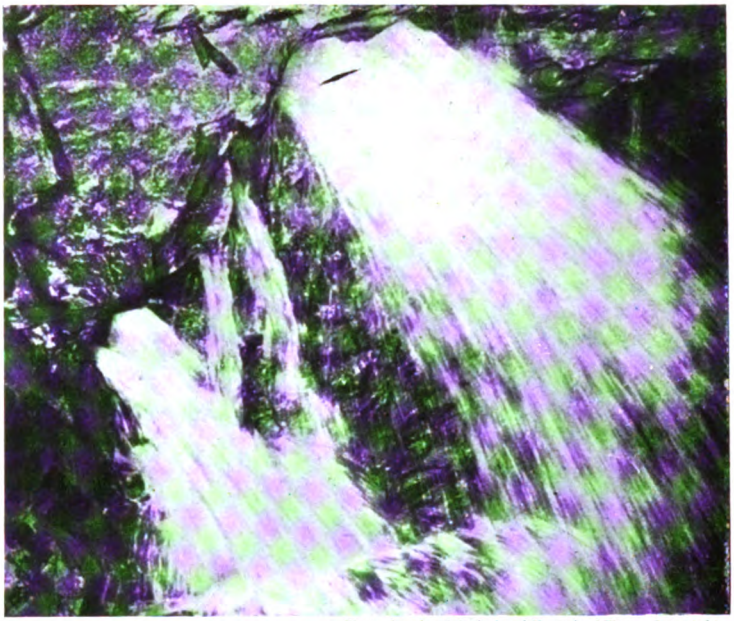

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THE GREAT SPRING IN GALLERY II

as possible. At a point 10,376 mètres from the northern entrance, or 809 mètres from the top of the gradient, further hot springs were encountered of such a volume that they filled the descending portion of the work with hot water, and stopped driving at the Brigue end in the month of May last. Meanwhile the work at the Italian face was pushed on, until in September last another hot spring of 114° Fahr. was encountered in each of the parallel galleries, amounting to about 1800 gallons per minute, and considerable difficulty and great delay were caused. By dint of extraordinary perseverance and courage, these springs were passed and soon left behind by the Brandt drill. The volume of water then emitted from the tunnel was still about 12,000 gallons per minute." When the junction of the galleries was effected, on February 24, the accumulated hot water on the Swiss side found its escape into the south gallery, and was discharged into Italy.

A word should be added about the splendid ventilation. The air supply from the Brigue end equalled 1197 cubic feet per second, and from the Iselle entrance 964 cubic feet per second. The method of supplying cool air near the face when it was some distance in advance of one of the cross-galleries was by carrying a sheet iron pipe below the roof of the heading. At intervals there was formed a connection between the hydraulic pressure main placed on the floor to project into the pipe a jet of air. This induced through the pipe a strong current, which was conducted right up to the face.

At the time of going to press (March 17) it is expected that if all goes well the "Fête de Percement" will take place on March 28, when the President of Switzerland is formally to open up the iron door in the middle of the tunnel, and thus open a new line of communication between Switzerland and Italy. From Calais to Milan will be 80 miles shorter, while the journey from Ostend to Milan will be 59 miles shorter than by the St. Gothard tunnel.

CONCRETE SUPPORTS CARRYING THE RHONE CANAL

Thus the water supply was brought to the tunnel works from the Rhone valley

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NEW METHODS OF OFFICE WORK

BUSINESS OPERATIONS FORMERLY CARRIED ON BY HIGHLY PAID EXPERTS AND BY ARMIES OF OFFICE MEN NOW DONE MORE QUICKLY AND EFFECTIVELY BY INGENIOUS MACHINES

BY

LEROY SCOTT

A REVOLUTION in the method of doing office work is now going on—a change from hand to machine. Perhaps this revolution can be illustrated, as well as by anything else, by the handling of circular letters. The circular letter, however much it may be snubbed by the majority of its recipients, has come to have the high respect of the business man, and to have a distinct place in the conduct of his affairs. Only a few years back the sending out of such letters was comparatively expensive and ineffective. To typewrite each letter was slow and costly; if printed, days might be lost in case the printer was crowded with work, and even after reaching the addressee the chances were that the letter would go into the waste basket, unread. The printing or typewriting done, the letter had to be folded by hand, and the envelope addressed by hand and sealed by hand. All these operations, where great numbers of letters were sent out, meant many persons, much time and much money.

But now circular letters may be handled quite differently. The mimeograph is so well known that neither it nor its work needs description here. An office boy, using one of the better varieties, can, in half an hour, turn off a thousand copies of the letter it took the stenographer ten minutes to write. For price-lists, reports, orders, letters of instruction, and similar matter that goes to persons already interested in the letter's contents, the work of the mimeograph is most satisfactory. All duplicating-machines try to profit by the fact that the average man will read almost any statements made in a personal letter, whereas he probably would give little or no attention to the same statements made in a printed circular or in an easily detected imitation of a personal letter. Mimeographs have striven to produce a perfect imitation of typewriting, but have fallen short of it.

One device that aims to fill the existing want is especially designed for use where the list of addresses is practically fixed. It is very much like the ordinary job printing press in appearance, and it uses type that can readily be set up in the office. The addresses are stamped on metal plates which are joined into endless chains. With a chain in its place on the machine, one impression prints the letter and the address—and, if desired, the signature in a different coloured ink. The address shifts with each impression.

The most conspicuous features of another machine are two hollow cylinders, each about ten inches long and eight in diameter, revolving on the same axis. Both cylinders are cut lengthwise with grooves, separated from each other by the distance between ordinary typewritten lines. One cylinder does the printing; the other holds the supply of type, each letter and figure having its separate groove. The types are of metal, and, though they can be slipped back and forth in the grooves, their flat top and broad base keep them from falling out. Setting up a letter is accomplished by slipping the type from the type cylinder on to the printing cylinder. The rest is simplicity itself. An office boy turns a crank, and printed letters shoot from beneath the printing cylinder as rapidly as the boy can feed them; or a motor can replace the boy at the crank and the speed be increased. The letter, after the address has been typewritten in, looks exactly as though it had been fingered out by a stenographer.

But before it is sent off the letter must be handled many times. Folding is still almost exclusively done by hand. Boys and girls, after becoming expert, can fold from four to six hundred letters an hour. But a machine exists for this work. It is a little larger than a typewriter, and in construction is similar to the folding machines used in large printing

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establishments. The letters are stacked on the top of the folder and are fed automatically. The machine may be operated by hand or by a motor. In the latter case, all you need to do is now and then to replenish the stock on top and take away the folded sheets. It "does the rest" at the rate of five thousand letters an hour.

Next the envelope must be addressed—though in business practice it would probably be addressed and waiting. As a rule, large concerns keep a list of the addresses of their customers, and possible customers—a list that is maintained in careful order. The central idea of almost all the rapid-addressing contrivances is the card catalogue system of keeping the addresses. Each card has the address stencilled in it, and the address is printed directly from the card upon the envelope.

The cards or plates are kept in cabinets in trays holding from two to four hundred. The contents of a tray are placed in the magazine of the addressing machine, which is operated either by foot power or by an electric motor. The cards are moved automatically one by one beneath the platen of the machine, their addresses are stamped upon envelopes (fed by hand or automatically), and they are then carried to a tray where they are deposited in the same relative positions they just occupied. The addressing is done at the rate of from two to seven thousand an hour. Of course, this method of addressing is impracticable where the list of addresses is small, or infrequently used, or subject to large and frequent changes. The method is also not adapted to addressing the envelopes of personal letters, however large the number being sent out.

After the letters have been put in the envelopes, then comes the sealing. A boy's left hand feeds the envelopes (or they may be fed automatically) into a little contrivance of brass and steel and rubber, his right hand turns a crank—and the envelopes come sealed through a pair of rollers at the rate of from three to ten thousand an hour, about ten times as fast as when the boy and his tongue did the work.

There will probably soon be on the market a practical machine for putting on stamps. A number of devices for doing this work have been exhibited, but they have not yet been brought to perfection.

Another field that is being worked by the makers of office devices is the keeping of employees' time. The clock mechanism, with its many number keys, standing at the entrance of stores and factories, will be recalled by the most casual observers. When an employee enters the store or factory, he punches his assigned key and in leaving punches it again, thereby printing in a chart the exact time of his arrival and departure. As the first punch causes a steel finger to drop upon a sensitised moving chart, and the second punch causes it to lift, the position and length of the scratch record the time of arriving and departing and the time spent at work.

Though these machines record the time a man spends in the factory, they make no pretence of recording what he turns out while there. The close margin of profit on which business is now done has made it highly desirable that an accurate account be kept of the "labour cost" of each article manufactured.

The time-stamp has developed, and now a machine can be had that calculates automatically and prints upon a card the time spent on each piece of work. When an employee begins a job, his card is inserted in the machine and a lever operated. This prints upon the card the time of beginning and also two handless dials, one for hours, the other for minutes. While the employee is at work the two dial-stamps in the machine are turning, the hour dial at the rate of one revolution in twelve hours, the minute dial at the rate of one revolution in one hour. When the job is completed the card is inserted in the machine in exactly the same position it first occupied. If three hours have been consumed by the job, the hour dial-stamp will have turned a quarter way round—that is, if the dial-stamp were now pushed down upon the first impression the 12 would be stamped upon the 3; if five hours had elapsed, the 12 would fall upon the 5. But a second impression of the dial is not made. Within the dial-stamp, which is a hollow cylinder, is an arrow that always points at 12 on the dial-stamp, or rather at 0 by which 12 is expressed. Instead of the dial-stamp being pressed upon the card, the arrow alone is depressed; so instead of 12 being stamped over 3, an arrow is printed pointing at 3, indicating the amount of elapsed time. The minute dial-stamp operates in like manner, and the same movement of a lever stamps both arrows. Instead of being divided into minutes, the minute dial-stamp may be divided into tenths, in which case the elapsed time is recorded in hours and tenths, a method more convenient for ordinary calculation. The machine will stamp the time of beginning, or the elapsed time, upon the cards of the

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men in a department just as rapidly as the cards can be inserted and a lever drawn.

Machines doing Difficult Sums

Of the many devices that perform brain work, perhaps the one most widely used is the adding-machine. All save the simplest computing machines not only add, but subtract, multiply, and divide; and there are machines, devised for insurance companies and other concerns constantly working with immense figures, that do long problems in multiplication and division with a speed that makes one think of magic. Take some such problem as this: 65,678,425 × 26,782,359 equals? The ordinary man, working it the ordinary way, would put down more than a hundred figures and spend about five minutes before he could give the answer—and then he may have made a mistake. With a machine you move a few pegs, turn a little crank a few times, and within ten seconds there it is before you—1,759,023,156,904,575. And the machine makes no mistake.

The adding-machines which are best adapted for use in the ordinary office have the same fundamental mechanism. There is a keyboard, similar to that of a typewriter, the keys marked with figures instead of letters. If the capacity of the machine is 99,999,999, then there are eight rows of keys, nine keys in each row and numbered from 1 to 9. The first row at the right is units, the second tens, the third hundreds and so on. Each row of keys operates a numeral wheel, which bears figures from 0 to 9. The simplest problem—say the sum of 7, 9, and 98 is required—will illustrate the method of operation. First the key numbered 7 in the unit row is depressed; instantly the unit numeral wheel revolves to 7. When key 9 in the unit row is touched, the unit numeral wheel turns to 6 and in revolving turns the tens wheel from 0 to 1, so that 16 is registered. To add 98 to this, key 9 in the tens column and key 8 in the units column are now struck, successively or simultaneously; the unit wheel revolves to 4, the tens wheel revolves to 1 and in making its revolution moves the hundreds wheel from 0 to 1. Each time a wheel completes a revolution it moves the next higher wheel forward a unit.

The machines will add, and perform other calculations, as rapidly as human fingers can touch the keys. Some machines merely record the result on the numeral wheels. Others also print in a column the figures to be added, and, when these are all set down, print the total. The printing mechanism of course necessitates extra power for its operation, supplied either by one hand of the operator or by an electric motor.

Every business man in the country whose affairs involve considerable calculation accords the adding machine recognition similar to that paid the typewriter. But the combination of the typewriter and the adding machine is still practically unrecognised. Only recently the salesman for such a dual machine received emphatic notice from one of the largest and most progressive of New York City banks to keep off its premises. This salesman persisted—and to-day the bank is an enthusiastic user of a number of his machines. The special field of typewriting-adding machines is work requiring writing to be used in connection with figures—such as lists of checks, pay-rolls, and the loose leaf system of keeping books. The figure keys of the typewriter are connected with the keys of the adding machine, and the same touch writes down the figures and operates the adding mechanism.

Machines that Compile Statistics

The adding machine in its most intelligent form becomes quite commonplace when compared to a system of accounting that, though not new, is just beginning to find its way into the accounting departments of concerns doing great volumes of business. This is a system first used in the compilation of statistics in the Census Department of the United States, and since adopted by the census departments of many foreign nations. The fundamental idea is the recording upon cards of certain selected facts and then tabulating these facts by machinery. The card used is of light weight manilla, and is divided by vertical ruling into "fields," in each of which are vertical columns of figures ranging from 0 to 9. It has been found that the basic facts in almost any business are either naturally stated in figures, or are capable of being expressed numerically. Each field in the card is designed for the registration of one class of facts, and facts in one class are recorded by punching out figures in their assigned field.

Punching the cards would seem at first thought to be a very slow process. It is quite otherwise, for an operator using the machine devised for the purpose can punch the items with great rapidity. The New York Central, which uses this system, has found that an experienced operator can in a day transfer to the card the details of 1500

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waybills, whereas in the old way a clerk could handle in the same time hardly more than a third that number. Facts common to a great number of cards, such as the month and day, are recorded by a gang punch which punches a dozen or more cards at once.

The next step is grouping the cards. For example, if all the cards punched with the date December 21 are collected, those cards will contain a complete record of the freight business of that day. If all the cards, for a day or a month, punched 00 in the commodity field are collected, those cards will contain a complete record of the road's business for that day or month in 00, which figures signify "merchandise." The number of groups into which it is possible to sort the cards is very great. The sorting is done by drawing off the cards with a knitting needle, or, where large quantities are handled, it may be done automatically by a machine devised for this especial work.

Next the facts in a group are tabulated. The tabulating-machine consists of a case inclosing adding-machines operated electrically from a pin-box. The pin-box contains a spring-backed pin for every possible hole in the card, and each pin controls by electrical connection its own part of the adding mechanism. The pin-box works against a plate, in which there is a hole corresponding to every pin. When a card is put in position against this plate and the pin-box pressed upon it, pins that meet the card are pushed back into the pin-box, but each pin that finds a hole passes through and thus completes its electrical circuit and operates its part of the adding mechanism. Each pin corresponds to a key of an ordinary adding-machine; if it passes through a hole 7, it moves an adding wheel forward seven units.

Cards may be fed to the tabulating-machine by hand at the rate of forty-five to sixty a minute, or they may be fed automatically. If a card is introduced that does not belong to the group being tabulated, the machine refuses to add the figures and announces the mistake. As many separate adding-machines may be incorporated in the tabulating-machine as are required; each tabulating-machine of the New York Central contains four adding-machines —for weight, freight charges, advance charges and prepaid charges. The amounts in these four classifications are added simultaneously at one impression of the pin-box.

This system is adaptable to many uses. Besides auditing freight accounts, it will compute shop costs, analyse and take account of sales, make distribution of expenditures, and make almost any analysis of a great volume of facts, recording the desired statistics. It is not only accurate and speedy, but where the amount of business justifies its installation it is much cheaper than the old system. For example, an electrical company that uses a single tabulating-machine to audit its monthly bills to customers, employs three girls and a boy to operate the system, replacing six high-priced experts.

Automatic Telephoning

The disadvantages inevitable in telephoning have been partially overcome by an instrument of foreign make—though the general serviceability of the device has not been demonstrated by usage in this country. It may be described as an ordinary telephone with a phonographic attachment. While Mr. Jones is in his office the attachment is not in use, but on going out he connects it with the telephone. When some one calls for Mr. Jones over the telephone, the phonographic attachment responds something after this fashion: "Mr. Jones is not in. This is a phonographic receiver speaking. Kindly give me your message and I will repeat it to him on his return." On coming in, Mr. Jones sees from a signal that a message is waiting him. He takes the receiver, and the phonograph delivers the messages (perhaps there are many) that have been confided to it.

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THE PURSES OF NATIONS

THE PRODIGALITY OF MODERN GOVERNMENTS—INCOMES OF THE WORLD'S RULERS AND THEIR MINISTERS—BANKRUPT STATES

BY

ARTHUR HARRIS

ONE of the great complaints of modern times is the heavy and continually increasing cost of living when compared with the state of things which prevailed in the not very remote past, and if this is true of private individuals, it is doubly so of nations.

Thirty years ago the revenue and expenditure of the United Kingdom were less than one half of what they are to-day, and in the period between 1880 and 1899, before the war in the Transvaal affected the country's balance-sheet, the annual increase amounted to 32 per cent. In 1881 the revenue raised per head of population was £2 7*s.* 1*d.*; in 1889 this average had increased to £2 13*s.* 11*d.* per head; and yet both these years were normal ones, showing a slight surplus of revenue over expenditure. Only quite recently attention was drawn in Parliament to this matter.

Looking abroad, the same phenomenon is observable to a greater or less degree in practically all the countries of the world. Between 1877 and 1900 nearly all the European Powers doubled their expenditure and many trebled it. Enormously enlarged armaments are usually held to be responsible for this growth in the expenses of Continental nations, yet we find that Switzerland, whose constitution forbids the maintenance of a standing army in the Federal territories, nevertheless increased her annual outlay in the period named from about 1½ millions sterling to over 4 millions. Russia more than doubled her expenditure, Germany, Norway, Portugal, and Roumania did likewise, and there is not a single instance of a reduction having been effected. Italy and Spain seem to have advanced the least in this respect, the annual expenditure of each of these countries being, in 1900, only about one-sixth more than it was in 1877. France augmented her yearly outlay by almost exactly one-third.

In the matter of amount, Russia holds the doubtful honour of habitually spending more money each year than any other nation in the world. In 1902 she expended over 291 millions sterling, an excess of 21½ millions over her revenue. This kind of thing has gone on for some years past in Russian finances, about 100 million roubles being regularly added to the national debt every year. In 1901 the total debt amounted to about 656½ millions sterling, and practically a quarter of the revenue is now annually absorbed in interest upon this charge. What the financial position of the Tsar's government will be upon emerging from the present expensive war, one does not care to contemplate.

The United Kingdom came second in 1902 with expenditure at 179¾ millions, but of course the expense of the war in South Africa was then at its heaviest, and in the same year the National Debt increased from 765⅛ millions to 798¼ millions, surpassing the sum owing by Russia at that time. Last year the aggregate liabilities of the United Kingdom were 794½ millions.

The following table shows in round numbers the total sums expended annually by the principal countries of the globe according to the latest available returns:

Monarchies

	£
Austria-Hungary	111,203,000
German Empire	115,132,000
Italy	69,861,000
Spain	29,976,000
Belgium	21,164,000
Turkey (£ Turkish)	16,737,000
Japan	14,900,000
China	13,530,000
Holland	15,120,000
Portugal	12,497,000
Sweden	9,562.000
Roumania	8,700,000
Norway	5,424,000
Greece	4,748,000
Servia	2,922,000
Montenegro	60,000

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Republics

	£
United States	129,500,000
France	142,609,000
Argentina	15,721,000
Brazil	9,530,000
Chili	7,568,000
Mexico	6,473,000
Switzerland	4,605,000
Uruguay	3,439,000
Venezuela	1,480,000
Bolivia	720,000
Paraguay	203,000
San Marino	18,000

These figures show that the administration of the United States, with her 3,000,000 square miles of territory and 76,149,000 of population (1900 census), costs only £14,000,000 more than the government of the German Empire, which occupies but 208,427 square miles with a population of 56,345,000.

Of course a heavy item in the expenditure of all non-republican peoples is the annual sum voted for the maintenance of the monarch. The German Emperor appears to enjoy the heaviest Civil List of any constitutional ruler. The figure is £600,000 per annum, compared with £470,000 allowed to our own Sovereign, but to this amount must be added an annual grant of £20,000 to the Prince of Wales, £10,000 to the Princess of Wales, and £1800 each to the King's three daughters.

The following table gives the Civil Lists of the various rulers as far as they can be learnt :

	£
Austria-Hungary	382,202
Belgium	132,000
China	225,000
Denmark	60,160
Egypt	255,361
Greece	53,000
Holland	66.666
Italy	157,000
Japan	300,000
Montenegro	8,000
Norway and Sweden	18,785
Russia (Imperial Cabinet)	3,305,000
Spain	338,000
Servia	48,000
Turkey	794.295

In the case of the Sultan of Turkey, the sum stated is that estimated to be drawn by him on the Treasury, and does not include the very considerable income derived from crown lands and other properties. It is calculated that about one-third of the richest land in the Turkish Empire is owned by the crown, and these possessions are not subject to taxation.

When compared with these figures, the annual sums allowed to presidents of republics appear insignificant. Some of the salaries are :

	£
France	24,000
United States	10,000
Chili	3,600
Uruguay	7,513
Salvador	3,000

The principal public debts of the world, according to the statistics published for 1903-4, were, in round figures :

	£	Annual cost of Service.
Argentina	183,575,000	6,301,419
Austria-Hungary	590,944.000	——
Belgium	115,761,000	4,932,120
Brazil (1902)	81,710,000	not ascertainable
Chili	23,175,000	1,232,332
China	56,500,000	3,000,000
Egypt	101,850,000	3,604,000
France	1,172,360,000	52,722,300
Great Britain	638,919,000	23,535,285
German Empire	143,799,000	3,885,050
Greece	28,424,000	1,293,760
Holland	96,561,000	2,906,214
Italy	510,501,000	27,560,000
Japan	52,903,000	——
Mexico	35,072,000	——
Portugal	177,192,000	4,434,243
Roumania	55,750,000	3,430,299
Russia	656,574,000	25,418,303
Sweden	19,009,000	659,000
Spain	387,000,000	16,552,470
Servia	21,969,000	808,000
Turkey	170,000,000	2,569,600

From the foregoing table it will be seen that France has the largest national debt in the world, and its service absorbs annually more than half the revenue of the Republic.

Turkish finances are in so delightfully hazy a condition that it is believed the Government itself does not know the exact amount of the floating debt, the figures quoted being in the nature of an estimate and not including the revenues conceded to the bondholders of the Ottoman Debt.

The developed resources of a number of countries are quite inadequate to enable them to make any attempt to reduce their indebtedness or, in many instances, to pay the accruing interest. South American republics are notorious in this respect. In 1872 the Foreign Debt of Peru amounted to £31,580,000, but no interest was paid after 1876, and in 1889 the accumulated arrears stood at £23,000,000 Then the Government conceded to the bond-

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holders all the State railways for sixty-six years, together with certain guano deposits, mines, and lands, on the condition that it was to be relieved of all responsibility for the loans.

If Costa Rica duly discharged her liabilities, the national debt would apportion about £28 per head of population, but no interest has been paid for many years and there are now £85,000 arrears due on a debt of about £2,000,000.

The government of Honduras has paid no interest on the external debt of that republic since 1872, and in 1900 the principal and accrued interest amounted to more than £18,000,000.

Guatemala has in recent years made a number of arrangements with her creditors for paying the interest on the external debt, but has consistently defaulted on each occasion. In 1901 Venezuela had an external debt of over four millions, besides £593,835 arrears of interest, but nothing was being done to discharge this. Bolivia, Ecuador, and Paraguay are (or have been within recent years) all defaulting States.

Coming nearer home, we find that Spain has twice been insolvent within the past half century, once during the revolution of 1868–1874 and again in 1900 at the close of the Colonial and American wars. Turkey made default in 1876, and in 1881 came to an arrangement with her creditors whereby the national debt was agreed to be reduced by about one-half. Under the administration of a council of foreign bondholders, the service of the Turkish Debt has since been fairly satisfactory. Greece declared herself bankrupt in 1893 and did not come to terms with her creditors until four years later. Gold and silver coins have practically disappeared from this state, none having been minted since 1884. The currency consists solely of notes and copper.

The rate of interest required on loans to all the foregoing countries ranges from 14 to 66 per cent. Portugal, Austria-Hungary, Roumania, Columbia, Uruguay, and Italy also have to pay from 6½ to 10 per cent. interest on loans abroad.

It is calculated that, in proportion to their resources, Spain and Portugal are the two most heavily burdened of European nations, as their combined debts amount to 29 per cent. of their estimated joint national capitals.

The following table gives the proportions, per cent., which the public debts of some of the leading countries bear to their estimated national capitals:

Spain and Portugal	29	per cent.
Russia	27	,,
Austria-Hungary	17	,,
France	12.8	,,
Holland and Belgium	6	,,
German Empire	6	,,
United States	6	,,
United Kingdom	2½	,,
Norway and Sweden	2	,,

In the payment of Ministers of State, many Continental nations admit of no preference. Belgium pays her eight ministers £840 each per annum. Unlike the Speaker of the British House of Commons, who receives a salary of £5000 a year, the Presidents or Speakers of both the Belgian Chambers are unpaid, but the deputies receive £160 per annum each while they hold their seats.

The French ministers receive £2400 a year each, and may reside at their respective ministries. Spain allows her ministers of the crown £1200 yearly. In Germany, the Chancellor of the Empire receives a salary of £8200 per annum, and the emoluments of the Ministers of the Interior and of Foreign Affairs are £3200 per annum each. Two other ministers, with the Postmaster General, the Presidents of the Imperial High Court and the Imperial Military Court, and the Secretary of the Imperial Treasury, are paid £1500 a year each; and the President of Imperial Railways £1000 a year. In addition to these salaries, all the German officers of State named are provided with official residences.

Of the American republics, Argentina pays her Ministers of State £3400 per annum and her senators and deputies not less than half as much, *i.e.*, £1700 per annum. Chili's five ministers receive £1200 a year each.

Compared with the above stipends, the salaries paid to our own statesmen appear very liberal. We have seven ministers, including the Premier, in receipt of £5000 per annum, two receiving £4500 a year and seven £2000 yearly.

It is not customary with us to pay the members of the legislature, but this is done in a number of other countries. France allows her senators and deputies £360 a year each. In Germany members of both Chambers have the right to travel over the State railways free of charge during the sessions. Mexican Members of Parliament receive £300 a year from the State, and in Paraguay the amount paid annually to each deputy and senator is £200. Roumania and Brazil also pay their legislators yearly salaries.

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COMMERCE IN LITERATURE AND MUSIC

SUMS PAID TO GREAT AUTHORS FOR THEIR BOOKS—HOW RANJITSINHJI GOT THREE HUNDRED GUINEAS FOR ONE MORNING'S WORK—PROFIT IN PLAYS—DRAMATISTS WHO HAVE MADE THEIR MARK—POPULAR SONGS AND WHAT THEY MEAN TO THEIR FORTUNATE COMPOSERS—THE QUESTION OF MUSICAL COPYRIGHT—THE SIXPENNY SONG

BY

PERCY CROSS STANDING

WHEN Charles Dickens surreptitiously and apologetically posted his little manuscripts in the editorial letter-box, did he ever dream, one wonders, of the golden treasury that the Fates had in store for him? Did his great contemporary, the Sage of Chelsea, chafe and fret (one does *not* wonder!) at the rich prizes that would fall to the lot of the "mere novelist," while the world was taking such an infinity of time to discover that the greatest historian-philosopher of the age had come to stay? Did Charlotte Brontë sit silent and alone in the cold old Rectory at Haworth, asking herself again and yet again what Destiny had in store for that first sweet child of her imagination which had gone winging its way across the moorland and the fenland to London town? Did George Eliot—but one might go on unendingly discussing the hopes and fears of the many great ones of our literature, who, ere success was theirs, had to learn to labour and to wait in the bitter school of hope deferred; and such is not my present purpose.

Until the advent of Sir Walter Scott and the vogue of that romantic school of thought of which he was, *par excellence*, the exemplar, anything approaching to very large or sensational terms had never been paid to an author. Milton had parted with the copyright of *Paradise Lost* for £5 (the equivalent of about £15 of our present currency), and thirteen hundred copies of that immortal work were sold in a period of twenty months. A century is a long time, however, and the magic of Scott's matchless poems and romances won for him large money prizes as well as the richly deserved honour of a baronetcy. It was estimated, at the time of Sir Walter's unfortunate failure with the publishing house in which he was a partner, that the great poet-novelist had earned a sum of about £80,000 by his pen. Like Mark Twain in our own time, Sir Walter applied himself to the noble task of liquidating the liabilities of the firm in which he had been interested—but with a far less happy result than in the case of the celebrated humorist. Dickens reaped a large fortune—several large fortunes—and Thackeray was not a great way after him. Lytton and Disraeli realised large sums by their books, and certainly the latter never experienced with a publisher the same difficulty that was his when he first attempted to address the House of Commons. Wilkie Collins received £3000 for the copyright of *No Name*. And the sum of £1000 received by Harrison Ainsworth for the serial rights in at least one of his splendid historical romances—*The Lancashire Witches*, was it not?—is really not at all a bad figure, even judged by the ridiculous prices frequently paid for "serial rights" nowadays.

The eminent firm of Smith, Elder and Co. has the distinction of having published practically all the great works of Thackeray and Charlotte Brontë, as well as one of the most celebrated of George Eliot's. I believe I am correct in stating that Miss Brontë received £5000 for more than one of her novels; while in the case of George Eliot the exceptional sum of £10,000 was offered by Messrs. Smith, Elder and Co. for the copyright of *Romola*. The circumstances under which the authoress ultimately received a payment of £7000 for *Romola* were told, a year or two ago, by the late Mr. George M. Smith in one of the magazines. Only one or two lady novelists belonging to the present epoch have been remunerated upon so handsome a scale as was the case with George Eliot. One of these writers is Mrs. Humphry Ward, who was stated to have received £10,000 from Smith and Elder for a particularly famous work of hers. Miss Marie Corelli is another, and Mrs. Craigie ("John Oliver Hobbes") has also made a fortune by her books and plays.

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Until comparatively recently, Messrs. Chapman and Hall were sole owners of the copyrights in the works of Dickens and Carlyle. They have also published many of the novels of Mr. George Meredith and Mr. Hall Caine. At the time, now nearly ten years ago, when Mr. Meredith commenced publishing with Messrs. Constable, it was rumoured that that enterprising firm immediately made a substantial four-figure payment to the brilliant novelist. But then Mr. Meredith's novels are no longer for merely "the cultured few," but for the many, and his works now boast a popular demand assuredly not less than the demand for the books of his only possible contemporary competitors, Mr. Hardy and the late R. L. Stevenson.

Many of the greatest book successes of the past twenty years have been recorded in volumes outside the realm of fiction—biographies, memoirs, travel, and the like. Thus Messrs. Bentley (whose business was subsequently taken over by Messrs. Macmillan) were understood to have paid Field-Marshal Lord Roberts £10,000 for his *Forty-one Years of a Soldier's Life*. Last year it was definitely stated that Mr. John Morley received £10,000 from the house of Macmillan for his *Life of Gladstone;* and I have always been told that Messrs. Sampson Low paid the late Sir H. M. Stanley a like sum for the story of his wonderful African adventures. Nansen and Sven Hedin were also heavily remunerated for their respective works on the Arctic and the unknown land.

I recall an amusing incident in connection with the writing of Stanley's *Darkest Africa*. The explorer wrote the bulk of the book in Egypt, where he halted for that purpose on his way back to England. In order to expedite matters, and having regard to the remarkable value of the manuscript, Dr. Marston, of the firm of Sampson Low, Marston and Co., made two or three voyages to Egypt in a swift steam-yacht, and brought away the MS. in batches. Dr. Marston's experiences were embodied in a little volume entitled *How Stanley wrote "In Darkest Africa"*—on which a caustic critic of one of the daily papers (the *Daily News*, I believe) remarked, "I suppose the next volume that comes up for review will be entitled *How Marston wrote "How Stanley wrote 'In Darkest Africa.'"*

Widespread and far-reaching as the interest in all sporting matters now is, the reader may be surprised to learn that Prince Ranjitsinhji has netted something like £6000 or £7000 by his *Jubilee Book of Cricket*. Admitting that this book is one which must stand as the cricket classic of all time, it is an exceptional sum for any book dealing with a "mere sport" to earn in author's fees. The publishers are Messrs. Blackwood. The famous cricketer also received, one day in 1903, the record fee of three hundred guineas for editing a single issue of the *Sun* newspaper. Most of the requisite matter was gathered and set up in type beforehand, this enabling Ranjitsinhji, after seeing the paper to press early on the eventful morning, to lead his team of Sussex cricketers into the field at Brighton on the very day that he edited the *Sun!*

Mr. J. W. Arrowsmith first came into prominence as a publisher, years ago now, by the publication of the late Hugh Conway's celebrated novel *Called Back*. This was originally purchased by Mr. Arrowsmith, as a Christmas annual, for £50. It is only fair to the publisher to add that, on discovering the immense success of his venture, he made a new arrangement with the author. Mr. Conway's novel was afterwards dramatised by Mr. Comyns Carr, was staged at a leading theatre, and ran for three hundred nights with Mr. Beerbohm Tree in the *rôle* of the villain, Macari. Since then Mr. Arrowsmith's publishing successes have been many. He paid a four-figure sum to Dr. W. G. Grace for his work on cricket, and I believe he paid Miss Marie Corelli £1000 for *Ziska*. Mr. Arrowsmith has also issued from his Bristol emporium many editions of Mr. Jerome K. Jerome's celebrated *Three Men in a Boat*, and has published with striking success several of the most popular novels of Mr. Anthony Hope Hawkins.

Turn we now to the more restricted and scarcely less interesting field of playwriting successes and failures. From first to last Sheridan must have realised fairly large sums out of such triumphs as *The Rivals* and *The School for Scandal;* but theatrical enterprise from the author's point of view, in the sense that H. J. Byron and Tom Robertson were to make it understood a century later, was then a thing undreamt of. And what would Sheridan have said to great triumphs like that of Mr. Hall Caine, who is said to have amassed £100,000 by the literary and dramatic rights of *The Christian*—or Mr. Wilson Barrett, who after a stupendous success with his *Sign of the Cross* on the stage wrote a novel from the same theme and sold it for £5000—or Mr. J. M. Barrie, with a fortune reaped from his *Little Minister* as book and play—or of the large sums earned

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for himself and his manager when clever Brandon Thomas evolved *Charley's Aunt?*

The London run of a successful play nowadays easily realises fees of several thousand pounds for the fortunate author and many thousand pounds for the lucky manager. The versatile Mr. Henry Arthur Jones has several huge dramatic successes to look back upon, any one of which may have exceeded £10,000. Long before he had written his three big successes—*Rebellious Susan*, *The Liars*, and *Mrs. Dane's Defence*—for Sir Charles Wyndham, Mr. Jones had fairly come into his own by writing for Mr. Tree *The Dancing Girl*, which enjoyed a run of 300 nights at the Haymarket. Still longer ago Mr. Jones had won his spurs at the fascinating craft which he adorns with plays of a more strenuous type, such as the world-famous *Silver King* and *The Middleman*. These fine dramas have, assisted by the acting of Mr. Willard and Mr. Wilson Barrett, earned large fortunes and been played all over the civilised world.

Mr. Jones's great contemporary, Mr. Pinero, is a slower worker, but one who, thanks to the half-score of delightful and delicate comedies which he wrote for fortunate Mr. Edward Terry in the eighties, has an equal record of work to show. Like Mr. Thomas Hardy in the realm of novel writing, Mr. Pinero has had "two periods." Just as Mr. Hardy thought fit to supersede his dainty Wessex idylls with his Tesses and his Judes, so did the dramatist come under the Ibsen convention when he bade goodbye to the land of sweet lavender and of schoolmistresses in order to discover a Paula Ray, an Agnes Ebbsmith, and a Lord Quex. The success of *The Second Mrs. Tanqueray* was immediate and spontaneous without the benefit of a doubt! Its original London run produced for the delighted manager a net profit of £20,000. When, a few years later, came that piquant play, *Lord Quex*, this record was lowered, and lucky Mr. John Hare reaped enormous profits on both sides of the Atlantic.

A brilliant brother dramatist of Mr. H. A. Jones and Mr. Pinero, the Australian-born Mr. Haddon Chambers, has at least four big financial playwriting successes to his name, in *Captain Swift*, *The Idler*, *The Tyranny of Tears*, and *The Fatal Card*. The last-named drama was written in conjunction with Mr. B. C. Stephenson (the well known librettist of *Dorothy* and *Doris*), and it ran for many months at the Adelphi. *The Idler*, which made such a sensation and enjoyed so long a run at St. James's Theatre, was only secured by Mr. George Alexander by a lucky accident. As it has had the distinction of numerous revivals, has toured extensively in America and the Colonies, and has also always been in great request among amateur actors, the author's receipts from this play cannot have fallen far short of £10,000 or £12,000. Mr. Sydney Grundy's best pecuniary successes have probably been from those clever plays wherein he has partially "adapted" or imitated a French theme. It would be difficult, nay impossible, to calculate the authors' and composers' fees paid on the long series of the Gilbert-Sullivan operas; are they not written in the book of the chronicles of the Savoy Theatre of hallowed memories? The latest brilliant recruits to the British playwriting brigade have been Messrs. Marshall and H. H. Davies, neither of whom has had any cause to be dissatisfied with the "trend of events." Yet there are not lacking those who still maintain that the native British drama is dead or doomed. It behoves one to call to mind Mr. Brander Matthews' witty commentary on the spirit of the age and the objectionable egotism that informs it:

"The native Drama's sick and dying,
So say the cynic critic crew;
The native dramatist is crying,
'Bring me the paste! Bring me the glue!
Bring me the pen and scissors too!
Bring me the works of E. Augier!
Bring me the works of V. Sardou!
I am the man to write a play'!"

Questions of the Musical Copyright controversy apart, one frequently finds oneself wondering whether the public at large ever really and truly realise the extent to which the song or ballad has caught hold of the popular imagination in these islands. And in no aspect of the case is this more striking than in the figures which go to show the enormous sums that have been and are being expended annually by music publishers in remunerating the most successful song-writers of the day. A certain song becomes popular and is immediately in very great and general demand. It follows that the publisher, if he be a shrewd and self-respecting publisher, promptly asks for more from the same pen, being perfectly well aware that the public who have bought the previous song will flock to buy the latter on the strength of the former's excellence. That is the *modus operandi*, and it is simplicity itself. If the level of the first effort be maintained, then the

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composer and the publisher—but particularly the publisher—proceed to reap a rich harvest, and everybody is pleased.

The history of the rise of the British ballad is, practically speaking, the history of the last fifty years. The middle of the nineteenth century found it but just emerging towards its present stage of super-excellence. With the advent of the late Sir Arthur Sullivan at his best the ballad became something like a real force in the land; but then it has to be recollected that Sullivan stood head and shoulders above most of his immediate contemporaries, a veritable Triton among minnows. Who, indeed, had he to reckon with among the ballad-mongers of his own land? After Dr. Cowen, Mr. Molloy, Mr. Michael Watson, and Mr. Blumenthal, there were not many to name or to be named, always excepting the peculiar charm of many of the compositions of "Stephen Adams." Small wonder, therefore, that the public went wild with joy over the beautiful songs of Sullivan, or that one of those songs alone—I allude to "The Lost Chord"—realised for the composer enormous benefits. Of Sullivan's other most popular melodies, few people that heard it could ever forget the late Sims Reeves' inimitable singing of "Once again," or Mr. Santley's rendering of "Thou'rt passing hence, my Brother." These delightful songs, together with "My dearest Heart," "Looking Back," and "Golden Days," were probably the most remunerative of all the great ballads of Sullivan.

Although it is true that he is not of English birth, Signor Tosti's residence of nearly thirty years among us, combined with the essentially English character of many of his finest songs, render it almost inevitable that we should place him with the foremost of the British masters of this peculiar gift. Signor Tosti has long been in the happy position of being able to command his own terms for any song that he chooses to produce. His two best known compositions, "For ever and for ever" and the celebrated "Good-bye," have also proved by far the biggest financial successes, albeit almost every one of his published songs has sold largely.

But it is unquestionably the veteran Mr. Michael Maybrick, better known to the public as "Stephen Adams," who has in the largest measure enchained the widespread support of the world of song-buyers. Indeed, I can only characterise it as astonishing that Mr. Maybrick has managed to retain his popularity during so long a term of years, though at the same time it has to be borne in mind that he has generally preserved a wonderfully high level of tunefuless and originality in the composition of those sentimental ditties with which his name and fame must for ever be associated. Large sums have been earned by his two quasi-religious songs, "The Holy City," and "The Star of Bethlehem," but those earlier efforts of his which have a nautical smack about them would, I think, be found to have reaped the most golden harvest. Of one of these pieces it is told that a certain famous vocalist, who had been going to exploit the song upon the concert platform, drew back at the last moment because he feared that it would not suit his voice. Whereupon Mr. Maybrick, who at that time sang a great deal in public, commenced singing the song himself. Sequel—it "caught on" with every one who heard it, and speedily realised a profit of thousands. Contrast this with Arditi, who sold the copyright of "The Stirrup Cup" for forty guineas! I should add that "Stephen Adams" had nearly parted with the copyright of "Nancy Lee" to his brother for £200.

Dr. F. H. Cowen has since turned to more serious work than is involved in the writing of ballads. Immeasurably his most acceptable song in point of popular favour has been "The Promise of Life," so happily wedded to the beautiful words of Mr. Clifton Bingham, and so splendidly popularised by Madame Clara Butt. The same vocalist has, by the way, done wonders for the remarkable setting by Dr. Liddle of "Abide with Me."

With the exception of Sir E. Elgar, no contemporary composer of British birth stands higher in the public estimation at present than Edward German. Success came to Mr. German early in his career, and he has never looked back. Mr. German informs me that his most successful song to date is "Love, the Pedlar." Quaint and charming as that song is, I was somewhat surprised to learn of its exceptional commercial success in view of the widespread popularity of his "Roses in June" (published by the Messrs. Ricordi) and also the immense vogue in their detached form of those splendid ballads "Oh, Peaceful England," and "The Yeoman," out of *Merrie England*. Besides these, there seems to continue a steady demand for Mr. German's exquisite and haunting "Country Dances," originally composed for the productions of *Henry VIII.* at the Lyceum and of *Nell Gwyn* at the Prince of Wales's Theatre.

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Of comparatively late years Lord Henry Somerset has won a very decided and sustained artistic and commercial success with his singularly pure, melodious, and original productions "Echo" and "A Song of Sleep." But, as I have frequently pointed out before, it is pre-eminently the women-composers of British birth who are leaving the impress of their individuality upon the songcraft of our time. It is a sufficiently significant illustration of what I mean, that composers of the calibre of Maude Valérie White, Liza Lehmann, Florence Aylward, Frances Allitsen, "Guy d'Hardelot," Ellen Wright, Térèsa del Riego, and Alicia Needham, are all among the most popular composers of the day.

Of these ladies, the foremost of them first won name and fame and money by the most world-renowned of her many lovely songs, "The Devout Lover." There has always been a large demand for Miss Florence Aylward's "Beloved, it is Morn," equally on the concert stage and in the studio. Indeed, I once heard a very eminent professor of music remark that such a great proportion of his pupils brought the song to him that he sometimes wished (entirely without prejudice!) that Miss Aylward's *tour de force* had not proved quite so immensely popular. ("I began the song in March '96," says Miss Aylward. "I wrote two verses, lost the words, and hunted vainly for them for three months. I had given up all hope of finishing the song, when at last the missing words turned up in a pile of music, and I wrote the last verse in June.") The gifted and cultured Miss Frances Allitsen has several big song successes to her credit. Sung by true artists such as Mme. Albani, Mme. Butt, Miss Ada Crossley, and Mr. Kennerly Rumford, her well known "Song of Thanksgiving," "There's a Land," &c., have met with a great and gratifying meed of public appreciation. Miss del Riego's "Oh, dry those Tears," has been an enormous success.

Sometimes Homer nods—and occasionally publishers—even publishers—make mistakes. Thus, it is a little known fact that the dainty songlet "Violets" had the honour of rejection by a very eminent and very astute firm of music publishers. The song has since earned large rewards for its composer, and several thousands of pounds for its publishers, in addition to reaping a substantial triumph in the United States as well.

While writing this article, I enjoyed a chat with Mr. William Boosey, the manager of the firm of Chappell and Co. Mr. Boosey informed me that he would rather not say anything on the subject of "prices paid to popular composers" pending the debate in Parliament on the Musical Copyright Bill. To the lay mind, the connection between musical copyright and the fees disbursed by publishers to composers who have been working for them regularly for perhaps twenty or thirty years, may not appear immediately obvious. All questions of "piracy" apart, publishers can scarcely expect to go on reaping their great harvest in quite such full measure as was their lot during (say) the last two or three decades of the reign of Queen Victoria.

At the same time, of course, the song-piracy problem had come to assume the proportions of so huge a scandal that legislation in some shape or form became inevitable for the protection of composer and publisher alike. And it says singularly little for the artistic appreciation of the present period of Great Britain's prosperity and glory that no move whatever was attempted in the direction of remedying this crying evil until the powers that be had been memorialised and petitioned time after time, and many columns of controversy, argument and complaint had been printed in the public Press.

Moreover, a direct result of the pirates' work has been the Sixpenny Song Movement. In addition to its pioneers, Messrs. Francis, Day and Hunter, whose publications are generally of the lighter order, at least two firms celebrated as purveyors of cheap literature—Messrs. Harmsworth and Messrs. Pearson—have taken a bold initiative in the direction of producing Sixpenny Songs. Ballads of the most serious order, and by song writers of established reputation, are being rapidly placed upon the market at this cheap rate. Mr. Edward Teschemacher, perhaps the freshest of song-poets of the younger generation, has been engaged to write lyrics exclusively for the Messrs. Harmsworth for a term of three years, while Mr. Clifton Bingham's busy pen is deeply engaged.

Nor is this all. The enterprising firm of Cassell and Co. have "gone one better" than their contemporaries by actually putting on the market a weekly musical journal at *one penny*, each number containing half a dozen songs and solos, in many cases by the best and best-known composers. Doubtless there is much to be said for and against the popular song movement, its use and abuse. But it has come to stay.

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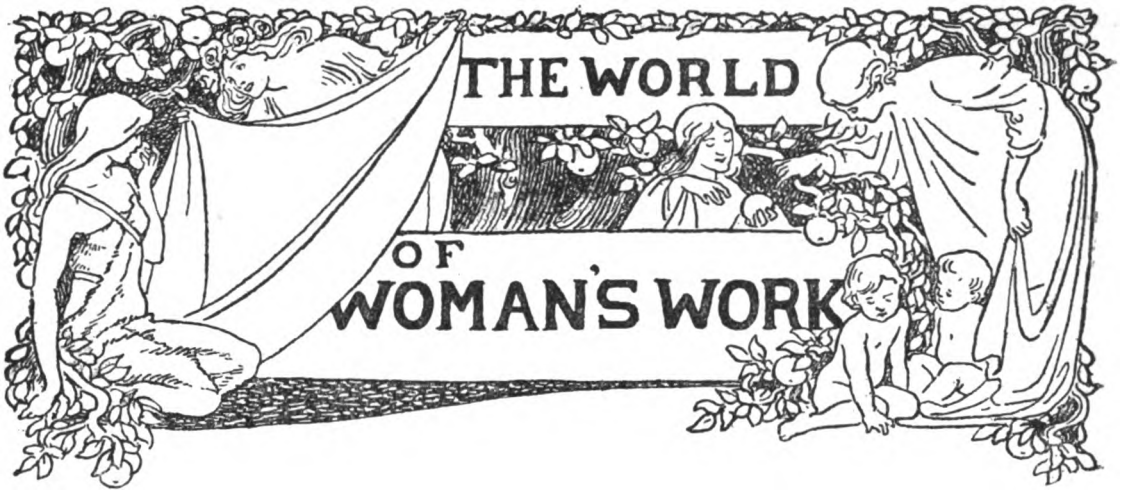

THE RISE OF WOMEN'S CLUBS. By Clarence Rook

THE woman's club is practically an English institution; one might even call it a London institution; for it has not yet spread beyond the limits of our shores, and is almost unknown even in the largest of our provincial cities. At the present moment the ladies of Paris possess no club-house of their own. Club life has never appealed to the women of Brussels, St. Petersburg, Vienna, Madrid, or Rome. In Germany there has for many years been the nucleus of the feminine club in the coffee parties which meet at the favourite restaurant in the smaller towns—gatherings of housewives who bring their sewing and exchange domestic news over a big round table. Here we find, of course, the root of all clubs, which sprang from the need of human fellowship over refreshment. The first English clubs for men were developed from the coffee-house, and the desire for stimulated and stimulating conversation. But Berlin, so far as I can discover, has at present only one club which in any way approaches the London ideal—the "Deutsche Frauen"—and Berlin has some claim to rank as the most progressive of European capitals. London, on the other hand, has at least a dozen well-known and flourishing institutions in which women may find almost exactly the same entertainment, facilities, and accommodation as are provided in the masculine counterparts. I put aside the clubs, such as the Bath, the Grosvenor, the Sesame (one of the best-managed and most successful clubs in London), and others, which admit both sexes on more or less equal terms; for woman herself has annexed a district; she has mapped out her clubland. And as the masculine clubland is Pall Mall and Piccadilly, with St. James's Street between, the feminine clubland has its centre in Dover Street. There has come now the final invasion of Piccadilly by the Lyceum. Fifteen years will easily cover the period of change. Fifteen years ago the question "Which is your club?" to your neighbour at a dinner-party would have sounded like a joke. To-day the answer is expected as a matter of course; and the woman of the world of society or of the world of art who does not belong to a club is regarded as eccentric.

Let us follow out briefly the development of the invasion which has stormed and cut the communications of masculine clubland. If you are of those who seek the causes of things, you will note two converging trains of influence: the revolt of woman, and the need of woman. The movement began with revolt. For the first woman's club of any significance was appropriately named the Pioneer Club. In this the two influences were for a moment combined. Members were supposed to have some common interest in the pursuit of freedom by way of art; but the prevailing note was that of revolt. It was started by the late Mrs. Massingberd, who wore short hair and skirts, and gave up the best part of her house in Bruton Street to the new club. They were Pioneers, and in a prominent place hung Mr. Machen's picture *The Birth of a Planet*, while in a prominent place in the principal room was emblazoned the challenge to all the world: "They say—What say they? Let them say!" Aggressiveness was the necessary note of the Pioneer Club when

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it really was pioneering; for the rank and file of members were a little nervous—and especially nervous about being seen in the smoking-room (with a luxurious divan), into which curious males were sometimes permitted to shoot a hasty glance; and they had to be encouraged to march along by the sound of drum and trumpet. Once, however, the Pioneers had blazed the track, others were quite willing to follow; and the Pioneer Club, with its strangely clad members shouting revolt in every ugly line of their clothing, bore the brunt of the advance. The note of revolt was no longer necessary; there came the second stream of influence—the need of woman. For when the nineties were young the stronghold of journalism—which is Fleet Street—had already been stormed by woman; she had become a journalist, a black-and-white artist, a person whom the neighbouring literary agents would not ignore. But she had no quarters in which to rest after her labours, no common meeting-ground with her fellow-workers, no private nook in which she could redeem the ravages of unswept stairs, anxious interviews, and the general buffeting of newspaperdom. She wanted a club. And she obtained it with the "Writers' Club" which still provides an inexpensive refuge for women-journalists in Norfolk Street, and week by week invites male friends to come and take a lesson in economy.

By this time the spirit of revolt had done its work; the revolution, the reign of terror, with its guillotining of such traditions as the incapacity of women to manage a club and the immorality of smoking (for women only)—all this was over; and the clubs developed on the lines of women's needs. To-day we have a long list of women's clubs, from the palatial Lyceum, occupying a bold position between the Bachelors and the Cavalry in Piccadilly, to the mere flat in which the tired shopper may obtain a daily rest for a guinea or so a year. The institution was born none too soon for the comfort of our womankind. It develops naturally with the amazing spread of London. Consider the situation. There are hundreds and thousands of women whom good or evil fortune compels to live many miles away from the business area of the metropolis. Many of them, now that they have decided to be something else than wives and mothers, must spend portions of their time at the centre, and require a home from home. To these, unwilling to face the restaurant unattended, the club is an essential. Others want a club in the shopping area, for, with all its semi-rural delights, the suburb has not yet developed the ideal dressmaker, milliner, or house-furnisher. Then there is that curious disease which the Americans call "house sickness"—the exact antithesis of "home sickness." It is engendered by long imprisonment in a flat. And the development of flat-life in London, with all its flatness, is responsible for the demand that elsewhere shall be found books, pleasant society, newspapers, and even a game of billiards; for in more than one woman's club you may find the billiard-room that is squeezed out of even a luxurious flat. The institution, you will perceive, is no longer a symptom of revolt, for no bishop would shudder now at being taken into the smoking-room of the New Victorian Club, though he might smile at seeing it announce itself as the Tea-Room. In another aspect, too, the club at the centre is merely the expression of the need of woman. Setting aside the thousands of women who have business within the business area, there are other thousands, living at Hampstead, Blackheath, Surbiton, Wimbledon, as far away even as Pinner or Reigate, who are really Londoners, with the social duties and aspirations of a Londoner. Now if the resident at Surbiton wishes to ask the resident at Hampstead to dinner, there is nothing for it but to suggest a week-end visit. From circumference to circumference across the centre is a day's journey. But we can all meet at the centre with ease. So it comes about that the instinct of social woman has fixed on the neighbourhood of Piccadilly as the centre to which all women of a certain station of life tend, more or less regularly. And the clubs have been immensely increased by the needs of the woman who wishes to meet her friends and would never see them at all were it not for the crossing-point at the centre.

But all these are purely social clubs, and modelled on the masculine club as exemplar. During the past year an extraordinary development has been begun with the establishment of the Lyceum Club in Piccadilly. The building had housed three men's clubs within five years, and when Miss Constance Smedley boldly took the premises many doubted whether, with lower subscriptions and less receipts for wine, spirits, and cigars, the rent and other expenses could be covered. All anxiety on that account is now over. Behind Miss Smedley stood an acute financier who knew the business in hand, what were the outgoings and what would be the incomings. The club is strictly confined to women who have published original work in literature, journalism, science, art, or music,

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women with certain specified university degrees, and the wives or daughters of distinguished men. It is, of course, a social club, having the advantage of the furniture of a man's club, including a billiard-room. But it aims to be a great deal more than this. Its aim, in the first place, is to link together at the London club-house women of all nations who write, paint, compose, or take any active and public part in the progress of knowledge. From America, France, Germany, and Holland came members, and the idea, already carried out in the first year of existence, was to welcome the foreign member into the club-house, and place her in touch with those who would be in sympathy with her.

But the Lyceum Club is prepared to do much more than this; for it has organised an information bureau, having communications with every civilised country. The bureau not only collects information as to the demands in various countries for pictures, translations, and so forth, but gives advice on the complicated laws of copyright, and even acts as a literary and artistic agency. Moreover, it is arranging a series of exhibitions of its members' work in foreign cities. To take a single example—there was opened in January an exhibition of arts and crafts at Messrs. Wertheim's New Gallery in Berlin. The possibility that the feeble work of the novice should creep in was almost excluded by the constitution of the club; it was entirely excluded by the submittance of the work to a committee of male artists, of whom Mr. Walter Crane was one. Berlin has already bought several hundred pounds' worth of the exhibits, and the collection, as I write, is now on its way to Bremen.

Within the first year of its life the Lyceum began the development of its idea of a world-wide sisterhood; and herein is the most remarkable phase of a "woman's movement" that threatens to make us all international, cosmopolitan, kindly. (For the Lyceum admits men as guests, does not "spank" them, but gives them dinner and a game of billiards.) In every big city of the world there shall be a Lyceum Club. That is the notion simmering in the brain of Miss Smedley. And the project is coming to accomplishment. Paris already has its influential committee, and its club-house engaged, for the idea had the advantage of appealing to the women who, though they had no club, were fearless in striking out a new path. In Berlin magnificent premises have been secured, and when the Paris house is in full swing the Berlin Lyceum will be opened, probably in October. The United States, Italy, Holland, come next; St. Petersburg will follow when Russian affairs are quieter, and Madrid, even, contains an enthusiastic nucleus for a Spanish Lyceum. The personal advantage of this international Lyceum—apart from the benefits the woman-worker will obtain from easy communication with other countries—is this: that the member of one Lyceum will be a member of all. The woman who alights in New York, Berlin, Rome, Florence, Paris, Brussels, or Birmingham, come whence she may, will present her credentials, find her clubhouse, and receive the welcome. The Lyceum card of membership is to be the woman's masonic sign.

THE MAKING OF A SUCCESSFUL SINGER

SEVERE STRUGGLES AND YEARS OF PREPARATION—WHAT EVERY ONE SHOULD REALISE BEFORE ADOPTING THE CAREER—THE END MAY NOT CROWN THE WORK—BUT IT IS THE MOST GLORIOUS OF PROFESSIONS

BY

MADAME ARCTOWSKA

MANY go on the stage with but small qualifications for the vocation of an actor. Many also adopt the musical profession with at best only a promising voice to encourage them. Few realise that there is perhaps no more arduous profession than that of a musician. None is so full of hard work, none requires so much self-abnegation and is so certain of disappointments. Only those who are gifted beyond the average, and have in addition an indomitable belief in themselves, are likely to succeed

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in the end. Who shall say whether an early facility in the elementary practice of music will lead to success if developed? and who will recognise in the first youthful enthusiasm for art the capacity for the infinite taking of pains, which, according to Goethe, is the only definition of genius? Those who depend upon instruments for the practice of their art have always the minor branches of their art to fall back upon. And if every one who learns the violin cannot enchant masses of people as a Joachim, still there are many useful and possible posts the artist may fill if he is moderately efficient. It is very different for the vocal artist, for the artist who depends upon his voice alone, or chiefly, as an artistic profession. The slightest indiscretion in his life, the accident of a bad cold, any want of constant, daily and unremitting care and prudence, may delay his career. The strings of a violin can be replaced by new ones, but the human voice once gone has gone for ever. Training for the instrumentalist and for the vocalist is more or less the same, and is surrounded by the same dangers. It is, however, of the most vital importance that the training should be the training suitable to individual capacity and idiosyncrasies. The best master for some may be the worst for others. And whereas the instrumentalist may remedy a mistake he has made in the choice of his master, the vocalist has far less opportunity and choice to do so, simply because his career is so much shorter and his voice may be irretrievably ruined before it has ever been developed. Often the most celebrated teachers are the least desirable for those who depend for their living upon training, because the most sought after master with many pupils depending upon him cannot, and will not, devote that same personal attention to the individual that a master with fewer pupils may do. Therefore, the choice of a teacher for a vocalist is one fraught with as much danger, and one which may be made with as much deliberation, as is the choice of a doctor. Teachers have been known, in London, to give sixty, seventy and eighty lessons a week. How can such devote that personal care and personal interest to the individual whose whole life depends upon this teaching, and who requires that the very best results shall be obtained in the training of nature's gift?

What then are the qualifications that the student must own, if he is to be successful? Considerable intelligence goes quite without saying, as does the possession of a good natural voice, but he must have patience and tenacity almost without a limit. He must never be tired of plodding, repeating over and over again phrases and practices—even single notes—and he must not be discouraged if the very phrases and notes that he was proficient in on one day seem to have escaped him on the following day. He must try again and again, and it may take months until his voice is properly posed, that is to say, that it is not forced either too high or too low, but just those notes and in that range which is natural to it, and that every tone comes from the right part of the vocal organs. If the high notes or the low notes have to be produced by an effort, the voice will soon wear out, and the forced notes will always seem unnatural, besides fatiguing the singer. Once the voice has been properly vocalised, the training proper only really begins; and the prudent master will no more keep the student entirely to solfeggios and scales. But it will be long yet before even in the simplest song any richness of tone is developed; and all this time diligence, persistence, industry, and, above all, the most determined care of health, are required.

While the musical training is going on the vocalist has also to master certain elements of the languages in which songs and operas are written, and in which audiences require a certain proficiency. For the day is long past when a faulty pronunciation of French or German or Italian is not visited with severity by critics and also by the public. We may take it that every vocalist must have a small knowledge of at least four languages. He must then commit to memory innumerable texts, librettos of operas. oratorios, songs, etc. Many a well-trained vocalist of to-day has by heart five or six hundred poems; and there are, especially on the German opera stage, many who have more or less by heart the twenty or thirty or even more opera parts which they are sometimes called upon at a few hours' notice to sing. In that case they must know, not only the words, but also, of course, the notes that are written for them, and also must remember the acting that goes with it.

At last, after years of preparation, after years of training, not only in the development of voice, but also in the acquisition of general musical knowledge, in the learning of languages, in the committing to memory of many pages of music and many hundreds of lines of poetry, the artist can at last hope to get engagements. But who will guarantee that opportunities will ever come, and will she or he just at that moment when it is most important to make a

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début, be in that perfect condition of physical health constantly necessary for a vocalist? At last the chance may have come, and then at that very moment the slightest indisposition may dash every hope, and the opportunity come back no more. In many, many cases the training takes so long that a voice originally good has lost its freshness before it ever has an opportunity of being exploited. Either a slowness of development in the voice, or a slowness in the acquisition of musical knowledge, delays the time when the budding artist is able to appear before the public. Or often the studies have to be left incomplete and opportunities are lost because of the want of means necessary to finish the preparation. It is very doubtful if a person who has been taken out of training for a while, and re-enters it, will re-enter at the same point as where he or she left off. For it is of the greatest importance that those going in for the training of the voice should live well and have an abundance of nourishing food. Assuming that all these struggles, all these difficulties, all these discouragements are over, they are the best training that an artist can have, and I believe that the truest artists are those who have had the severest struggles, for there are not many to whom a Divine Providence has levelled a royal road to success with only small effort. It is well that any one and every one who is gifted with a good natural voice should realise, before adopting the career of a vocalist, the difficulties that this career is beset with. If I have painted them more black than may appear to others, I have done so with no desire to discourage, but only with a desire to warn those who would enter a musical career of what they must be prepared to face. Any one who has heard Madame Ternina, for instance, in one of her great parts, should bear this in mind, and realise that although she is now on the height of the most glorious of professions, she has, no doubt, had many severe struggles and many a setback. But would she therefore choose differently to-day than what she did choose when she began? Surely not. And as for those who walk in minor walks in the operatic world or in the concert world, I believe that there is not one who has had even a moderate success who would, if he or she had again to choose, not choose the same line. For when success comes, be it big or small, it has a sweetness with it such as no other success can have. Only one who has ever held an audience thrilled, electrified, subdued, can know what it is when the thunder of applause greets his or her performance. Those are sweets quite apart from monetary prizes the profession may offer to the more fortunate, the real bait that lures so many. I verily believe that the greatest in the land might envy such, and say, as Alexander said to Diogenes: "If I were not Alexander, I would be Diogenes."

Beresford

MADAME ARCTOWSKA

THE WRITER OF THIS ARTICLE

Specially photographed for THE WORLD'S WORK AND PLAY

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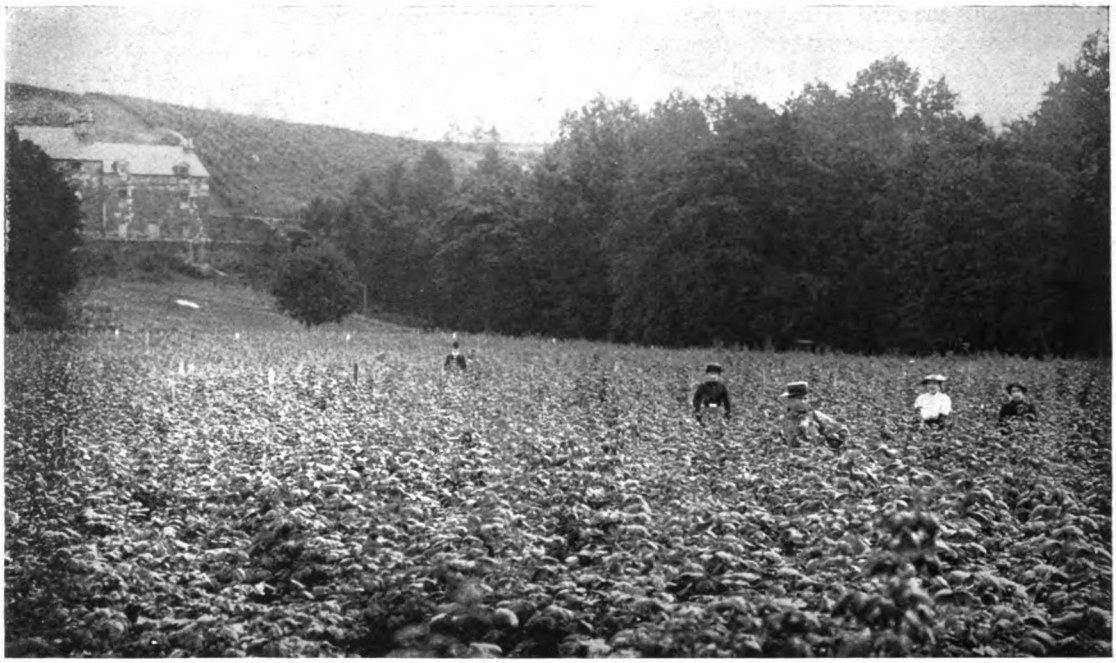
GLASGOW GIRLS PICKING RASPBERRIES IN THE COUNTRY

A two-year-old experimental plot at Blairgowrie



WOMEN IN THE FRUIT-FIELDS: WORK AND PLAY

AN EXPERIMENT IN SCOTLAND

THE FRUIT-GROWER'S DIFFICULTIES AND THE OBJECTION TO DISREPUTABLE PICKERS—HARVEST TIME AT BLAIRGOWRIE—HOW WEARY GLASGOW GIRLS GOT A MONTH'S CHANGE OF WORK AND A HOLIDAY

BY

J. M. HODGE

THE fruit-farmer has much to contend with. A night's frost in the spring of the year, a few days' rain or scorching sun at the height of the fruit harvest, a wet season or a dry season, may destroy the fairest promise of an abundant crop, and leave the fruit-grower stranded. There is no other industry that I can think of where man is so much dependent upon the weather, and where in some seasons it is so difficult to believe that all things are working together for good. But these are difficulties over which the fruit-farmer has no control. Of the controllable difficulties perhaps there is none greater than the difficulty associated with the reaping of the fruit harvest. When it is in full swing in England, the slums of London and other large cities send out to the country thousands of their destitute, their drunken, and their criminal classes, who live anyhow, on the roadsides and in the fields, kept in order by an increase of the police force. Since Scotland became prominent as a fruit-growing centre, the same class from the slums of northern towns make yearly pilgrimages to the fruit-growing districts just as they do in England.

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They are in a way the salvation of the fruit-grower—though many a fruit-grower wishes with all his heart that he could do without them—for they reap his crop when no other class can be got. But they do it in some cases at great expense to the community. It is not too much to say that the fairest portions of the country from the tourist's point of view cannot, in present circumstances, remain at the same time a fruit-growing centre and a summer resort. Tourists will not live in a district where the worst specimens of town life are let loose for six weeks.

Now, it seems to me that this problem might be solved in a way that would be at once advantageous to the fruit-grower, to the residenter and visitor in the fruit-growing district, and to the respectable poor of our large cities, against whom there is nothing to say whatever. It is not the poor—it is the drunkard and the criminal that are objected to. There are thousands in the town unable to take a holiday, and yet from a physical point of view, if the standard of the race is to be kept up, it is absolutely necessary that they should get a holiday. There are difficulties in the way. There is not a fruit-growing district, for example, of any importance in any part of the country which has not more or less of a bad name in connection with its berry-pickers, and respectable working people from the city refuse to be associated on the fields with that disreputable class. Besides, if respectable people are to be employed, suitable accommodation must be provided for them, and that means considerable outlay to the fruit-farmer, which he may not be able to recover. The difficulties, however, are not insuperable, and I write this article to describe an experiment, in the hope that it may be the means of solving the picker problem so far as the fruit-farmer and the residenter in the fruit-growing districts are concerned, as well as helping to solve the much greater and more complex problem associated with life in the slums of the city.

My firm holds land in the Blairgowrie district—far-famed now for raspberry culture—and we are among the largest growers of raspberries in Scotland. A few years ago we managed to pick our fruit with local people. The tramp, however, had become an annual visitant to the district, and proved himself a nuisance and a danger. His presence was bidding fair to ruin Blairgowrie as a summer resort. Newspapers took the matter up, and it became the topic of conversation in the district. As our acreage under fruit extended, it became evident that we would need to employ other than local pickers. We were unwilling to resort to the tramp class, though it seemed a necessity, and may yet be a necessity; that will depend upon the willingness of the town girl to exchange the stifling atmosphere of the city for a month of fresh air and simple living among the hills. We applied to industrial schools, to charitable institutions, and to the Salvation Army, and were despairing of being able to do anything when one of our letters reached the Scottish Council for Women's Trades in Glasgow. Miss Irwin, the secretary, a lady well and widely known for her interest in women workers throughout the country, saw that there was a possibility, under our scheme, of a remunerative holiday for many a weary woman worker in Glasgow. She took up the matter with all the enthusiasm that characterises everything she does, and before long was able to assure us that she could find a hundred girls who would be willing to come to Blairgowrie during the fruit season of 1903, provided suitable accommodation was erected for them.

This offer came as a surprise to us. We could hardly understand how it was possible for a hundred women to give up steady employment in the town for four weeks' work in the country. We subsequently learned, however, that at that particular season of the year, women's work in Glasgow is very slack, and many employers are not only able but most anxious to dispense with their workers for a time provided they get them back when the busy season comes on. Instead, therefore, of doing an injury to the Glasgow employer we were really doing him a service. Having Miss Irwin's assurance we at once set about the erection of the necessary accommodation at Westfields Fruit Farm, which is situated on the banks of the Ericht at the very gateway to the Highlands. The highway to Braemar, thirty-five miles north, passes near by, and the stage coach-and-four, with its red-coated driver, one of the few remaining links with the past, may be seen every day. There is a beautiful avenue leading from the Braemar road to the farm buildings. The buildings are thus off the road and isolated, and the grounds extend to the river side. Fortunately for us, immediately after we entered into possession of the farm, the steading was burned almost to the ground. In the course of re-erection certain of the stone walls were utilised for our housing scheme. We were thus able to make more permanent and better accommodation than would otherwise have been possible. Two cottages were fitted up

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as bedrooms. A large dormitory to accommodate thirty-two girls and two smaller dormitories to accommodate fifteen each were erected. A kitchen, furnished with three portable boilers and a gas-stove, and a dining-hall, capable of seating about one hundred and twenty girls, were run up. An outhouse was transformed into a wash-house, and on the suggestion of Miss Irwin a bath was obtained. The dormitories were provided with iron bedsteads and toilet requisites. The bedding consisted of a tick filled with straw, a pillow, a sheet, a pair of blankets, and a bedcover. The buildings and furnishings cost about £250, not a very large contribution towards the farmers for carrying out an experiment of the kind I am describing. Water from a spring about half a mile distant had to be carted. This necessitated the employment of a carter, whose spare time was utilised in driving provisions and acting as general handyman to the establishment. We had also to secure the services of a doctor, as it was more than likely, should the summer be warm, that girls accustomed to work inside would become sick when exposed to the hot summer sun. At any rate, the precaution was taken, and Dr. Gardner, of Blairgowrie, was employed, but fortunately not much needed.

A DORMITORY AT WESTFIELDS FRUIT-FARM

solution of an admittedly difficult problem. When the arrangements were completed, Mr. John Kidd who had seen service with the Sharpshooters in South Africa, and whom we had known as a capable organiser, and his wife, a trained cook, who proved herself to be even more capable than Mr. Kidd, were engaged to superintend the work. In a rash moment we promised not only to board and lodge the girls for the comparatively small sum of 6s. per week, but to serve them as well. In consequence of that promise, which was more generous than wise, three servants had to be employed, to clean out the rooms, cook the food, and serve the tables. There is no water system at Westfields. We were, therefore, more unfavourably situated than some fruit-

The first contingent left Glasgow on Monday, July 20, and were met by Mr. Kidd at Coupar Angus—from which a line runs to Blairgowrie—on the afternoon of that day. All available brakes had been secured to drive them to Westfields, which is distant a mile and a half from the station, and a two-course dinner was ready in the dining-hall when they arrived. After dinner the girls were shown to their different dormitories, and the afternoon was spent in sightseeing. The next contingent came the following Saturday, and they too were driven in brakes to the farm. The party was now complete. We had endeavoured to provide for their comfort as far as we could—with one exception: we had made no provision for religious service. This was an intentional

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omission. We took for granted that the girls would have church connection and we helped them to find out where the different denominations worshipped, Catholic and Protestant alike. We wanted Westfields Farm to be a home to them while they were in Blairgowrie, each girl having the liberty to use the farm and grounds as other people use their own houses and gardens on a Sunday. Mr. Kidd, however, learned that there was a desire for Sunday service at the farm. He thereupon communicated with different ministers, and there was a service every Sunday. Attendance, of course, was not compulsory, but most of the girls attended. During the rest of the day numbers worshipped at different churches in the district.

We had promised to board and lodge the girls for 6s. a week. That meant nothing for lodging and little enough for board. The board consisted of three meals a day. In addition and without extra charge, each woman was supplied with bread and butter and a cup of tea before starting work in the morning. Breakfast was served at 9 o'clock. To begin with, there was fish or eggs and tea, but a desire was expressed to have porridge, and ultimately the breakfast consisted (except on Sunday) of porridge and milk, followed by tea, bread and butter. Dinner, at 1 o'clock, as a rule was composed of meat and potatoes, or soup, bread and beef, followed at the request of the girls by bread and tea. On Sunday, almost invariably, there was beefsteak pie for dinner, and in the afternoon of every day there was plain tea, jam made from fruit picked by the girls being always on the table at tea-time. Apart from the excess of tea, to which we objected, I think the food was good and wholesome, and some, at least, of the girls came up considerably in weight. I asked two of them before they left, and one said she had increased by one stone, and the other by one stone two pounds.

Six weeks in the country is of far more importance to people who live in the town from a physical point of view than from any other point of view. There can be no doubt, however, that to many the main inducement is financial, and if this were wanting, fewer women would be able to take advantage of four weeks in the fruit-fields. In 1903 everything was against the experiment from a monetary point of view. There was little sunshine and the fruit crop was late and deficient. During the first week the girls were in Blairgowrie there was not enough work to keep them employed. They had to be sent out to the fields to hoe, but even that was not sufficient. After the first week, the difficulty in connection with the want of work would have been removed had it not been for the extremely wet weather. The rain made work unsteady. This and the shortage of the crop prevented the girls making the good wages they otherwise might have made, for good wages can be made picking raspberries at ½d. per lb., which is the rate in the Blairgowrie district. Notwithstanding that the stars in their courses seemed to be working against the girls and us, one woman, who, so far as we know, never picked raspberries before, made 23s. in one week. This showed what was possible, and made us hopeful that in better years there would be money in the fruit harvest for the city girl as well as for her more fortunate country sister.

THE GIRLS AT TEA

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AFTER THE DAY'S WORK

In order to make the sojourn at Westfields as much of a holiday as it could be made in the circumstances, we had arranged for weekly excursions to places of interest in the neighbourhood of Blairgowrie. There was less opportunity for this than we expected. Still there was more than one excursion to Craighall, one of the loveliest bits of scenery in the district. We were not, however, able to spend our whole time in the open, as the days were getting short. Weekly and bi-weekly concerts were accordingly arranged, a piano having been provided for the entertainments by my partner. The girls themselves contributed to the entertainments, as well as friends from the neighbourhood and from distant parts of the country. Towards the end of the girls' sojourn a limelight entertainment was given, the pictures representing scenes in their life from the time the train was seen steaming into Blairgowrie.

Thus ended an interesting experiment, the only experiment of the kind, so far as I know, that has ever been tried in the United Kingdom. But it was only an experiment. It was, however, so successful that it at least promises a solution of the picker problem, and we at once decided to repeat it. We entered into an agreement with the Scottish Council for Women's Trades to procure for us last year as many girls as we required, and we proceeded to consider alterations that experience had taught us were necessary. The want of a drying-room where wet clothes could be dried had caused inconvenience last year, and a brick building, heated by a stove, was erected. A store for provisions and a reception-room for visitors were added to the buildings, and chaff beds were substituted for straw as being in every way more comfortable. Over a hundred girls of a superior type, including a number of the best of the previous year's workers, applied to be engaged, and presented to Miss Irwin the necessary certificates of character. They were drawn from many occupations. There was a mantle-maker, a saleswoman, a clerk, domestic servants, machinists, dressmakers, umbrella-coverers, and factory workers. They did not come till the fruit harvest was well begun, with the result that, but for the rain, there was no broken time. Steady employment left little opportunity for excursions into the country, but fifty of the girls were twice driven to the fruit harvest at the small holdings at Essendy, about five miles from home. There was, as a rule, one concert every week.

Better wages were made last year than before. Some of the pickers did not do well and never will do well, because, like some of the local pickers, they were incapable. This class, however, will be gradually weeded out. The capable women made money. Some of them in the busiest week made over 19*s*., and one woman and her boy made £1 7*s*. 8*d*. In three weeks three of the best pickers earned £2 14*s*. 2*d*., £2 18*s*. 7*d*., and £3 2*s*. 6*d*. respectively, and the best picker we had, the picker to whom I have referred as making £3 2*s*. 6*d*. in three weeks, earned during the month she was in Blairgowrie, notwithstanding wet weather, £3 14*s*. If there is deducted from this her railway fare from Edinburgh, amounting to 6*s*. 11*d*., and her board of 24*s*., there is left £2 3*s*. 1*d*. as profit on her four weeks' work. The girls are looking forward to next summer. We shall need two hundred workers, and two hundred is a comparatively small number compared with what will be required in the future when the small holdings at Essendy, under our control, are in full bearing. A thousand girls will then have an opportunity of spending a remunerative month on the banks of Marlee Loch, amid scenery which reminds one of the Italian lakes and the wonderful landscapes of northern Italy.

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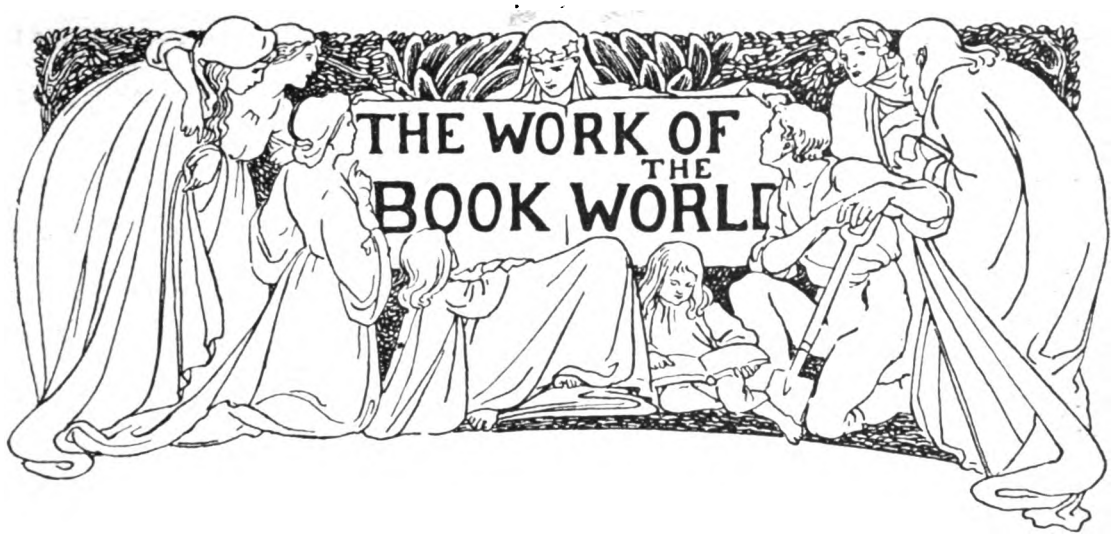

LONDON, *March* 13.

IN spite of the fact that larger volumes of more serious import have made their appearance during the past few weeks, it is but common justice to award the leading place among the books of the month to a novel by the foremost of present-day women fictionists. It is not often that one can choose from the unending run of novels one which possesses, aside from its interest as a story, so many commanding attributes, and casts so many sidelights upon the best phases of English life. Mrs. Humphry Ward has travelled far since she first gained the ear of the world with "Robert Elsmere," a novel possessing all the weaknesses expected of feminine treatment of a religious subject, all the weaknesses attending any novel with a purpose. Mrs. Ward is now what may be called the founder of a new and curiously attractive school. She has adapted all the charm of the historical novel to her own ends without in any way suffering from the often fatal restrictions which historical fidelity imposes upon fiction. It will be remembered that her last novel, "Lady Rose's Daughter," was in reality founded upon the life and love affairs of a famous Frenchwoman whose correspondence is one of the treasures surviving from the days of the French salon as it flourished in the eighteenth century. But Mademoiselle Lespinasse was re-incarnated into London society of the 'seventies. In the new book Mrs. Ward has followed the same plan even more comprehensively and perhaps more successfully.

A Mosaic of Modern Social History

It would be difficult for the most uninformed reader, however absorbed with the story as a story contained in *The Marriage of William Ashe* (Smith, Elder, 6s.), to be deaf to vague echoes of political and social London life during the past century. To the reader well acquainted with the subject, the book is a never-failing delight. For every page contains some separate thread of interest drawn from many sources woven into a singularly harmonious and effective whole. Memoirs of 1840, political situations of 1860, social cliques of 1890, and the international developments of this morning's paper all come as servants to Mrs. Ward's pen. At a time when one is unconsciously recalling events in the life of the gorgeous Lady Blessington, or is seeking to unravel fact and fiction from the famous marriage of William Lamb (later Lord Melbourne), one suddenly is aware of the use of some very recent and modern development put back and completely in tune with the book's period. Mrs. Ward sets out to tell the tale of London social and political life in the later 'sixties. She begins with a description of the home of William Ashe, son and heir to Lord Tranmore, and even then, before the plot is unfolded, one realises having read the same things about the devotion and the ambition of the mother of Queen Victoria's much-beloved first Prime Minister. The next stage in the story takes the reader to the curious salon held by Madame d'Estrées, which is obviously that of Lady Blessington, where, in consequence of the irregular early history of the lady herself,

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MRS. HUMPHRY WARD

THE DISTINGUISHED WRITER WHOSE LATEST NOVEL IS REVIEWED IN THIS NUMBER

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all the most famous men of the day gathered without their wives. Here is where a transmutation of plot takes place, for the pseudo-Lady Blessington is given a daughter, the heroine of the story, who becomes in turn a reincarnation of Lady Caroline Ponsonby, better known as Lady Caroline Lamb, wife to the future Prime Minister. In a masterly fashion, Mrs. Ward describes the fascination which the daughter of such a mother, with all her charm and all her vagaries, would have upon a sober, ambitious young politician. The familiar story of Lady Blessington is made plain very early by the appearance of her unhappy step-daughter, whom she has basely sacrificed in marriage to her lover D'Orsay, in order to secure the girl's dowry for their own extravagant expenditure. The sad picture of this half-sister of the heroine (if sister she was at all, for there are vague hints that Lady Kitty herself was daughter to the last of the dandies), overshadows the early life of the heroine, even before her marriage to William Ashe. But what is so noteworthy is Mrs. Ward's success in overcoming any trace of historical restraint, and of causing Lady Kitty Bristol absolutely to live before the reader in all the charm of her brilliant and erratic character. After the marriage of this ill-assorted pair, united on both sides by a most sincere love, the story develops into the familiar problem before a public man, of the contest between his public and private life, the necessity for sacrificing either his wife or his ambition. The chapters of the book carry the reader through a glittering maze of London society, all bearing the proper tone of time and yet all amalgamated from various events extending over a period of nearly a hundred years. There may be some little surprise at reading that in the 'sixties there was in London a certain set of social æsthetes who were known as the Archangels, because one has much later known and heard of a similar body as the Souls. Then, too, one of the most important events in the unfolding of the plot takes place at a famous fancy-dress ball, where the most beautiful princess who has graced the English throne for generations appeared as Margaret of Valois—which at once fixes the scene at Devonshire House during the Jubilee festivities of 1897. One even finds a discussion of current political events, such as the expedition to Somaliland, all coming within the Parliamentary duties of William Ashe. And where these definite and easily recognisable events are found there are also various vague half-portraits in the multitude which fills the background. The great contest between Lady Kitty Ashe and her husband's chief, Lord Parham, and the Prime Minister's vulgar wife, raises vague shadows of both the character of the Palmerstons and of Mrs. Disraeli. The marriage is obviously doomed to failure, even if the reader knows nothing about the career of Lady Caroline Lamb. How her husband's love and devotion followed Lady Kitty through many trying crises to the inevitable result of her impossible conduct at the end is told with a charm which easily carries the reader forward and is quite independent of the mosaic character of the groundwork. Mrs. Humphry Ward has never done a finer piece of work than the character of this brilliant woman who realised her own erratic weaknesses and who constantly had a premonition of her doom. She, poor thing, had to work out the inevitable destiny of her bad blood. Therefore, she never loses the reader's sympathy and appears as she must have appeared to her often-distracted husband. Perhaps the least convincing scene in the book is where she finally elopes with her poet-lover, upon whom Mrs. Ward may have vented some personal antipathy by giving him all of Byron's baseness with little of Byron's charm. But after this overthrow of the marriage, after William Ashe decides that the Premiership which he has in view can no longer be sacrificed to domestic affection, Mrs. Ward is true to her historical prototypes in sending the husband to the bedside of his dying wife, and closing the book in a moving scene of love and forgiveness.

Out of the Depths

Posthumous books have always a curious "voice from the grave" effect, even where they are nothing like autobiography. But the latest and last publication to bear the name of Oscar Wilde, *De Profundis* (Methuen, 5s.), is so tensely personal as to carry with it even a more ghostly significance than usual. We seem nowadays so far removed from the glitter, the paradox, the artificiality, the terrible tragedy which his name calls to mind, that it requires something of a retroactive mental effort to take up again the thread of the old and shocking story. Those of us who can remember the sheer delight with which the work of this man was received, who can recall the old charm, always somewhat exotic and superficial, of his plays and his books, have in the years which followed his oblivion grown somehow out of the humour for his strange genius. Much has been said and written for some years about an unpublished book in the hands of his literary executors,

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said to have been written during the days of his prison life. This is the book which is now given to the public over the signature of Mr. Robert Ross, who evidently remained a friend of its writer through all bitterness to the end of his life. There may be two opinions of the pride which the editor takes in this fact, and in the constant allusion in the book to the friend R., which one can only suppose to be his own initial. If this is the case, and Mr. Ross fails of the meed of merit which he thinks should attach to such faithful service, he may well console himself with the fine tributes paid in the book itself to his fidelity. Here is a passage about such an act of friendship:

"Where there is sorrow there is holy ground. Some day people will realise what that means. They will know nothing of life till they do. —— and natures like his can realise it. When I was brought down from my prison to the Court of Bankruptcy, between two policemen, —— waited in the long dreary corridor that, before the whole crowd, whom an action so sweet and simple hushed into silence, he might gravely raise his hat to me, as, handcuffed and with bowed head, I passed him by. Men have gone to heaven for smaller things than that. It was in this spirit, and with this mode of love, that the saints knelt down to wash the feet of the poor, or stooped to kiss the leper on the cheek. I have never said one single word to him about what he did. I do not know at the present moment whether he is aware that I was even conscious of his action. It is not a thing for which one can render formal thanks in formal words. I store it in the treasure house of my heart. I keep it there as a secret debt that I am glad to think I can never possibly repay. It is embalmed and kept sweet by the myrrh and cassia of many tears. When wisdom has been profitless to me, philosophy mere sound, and the proverbs and phrases of those who have sought to give me consolation as dust and ashes in my mouth, the memory of that little, lovely, silent act of love has unsealed for me all the wells of pity; made the desert blossom like a rose, and brought me out of the bitterness of lonely exile into harmony with the wounded, broken, and great heart of the world."

He who had been so witty and so heartless appears here in a new light. The book is a veritable monotone of sorrow. It is, as it were, a voyage of discovery through the land of shadows, because until he entered the prison gate the writer seems never to have looked upon the face of grief or to have realised that it existed in a sad world. But, Columbus-like discoverer of lower depths though he be, he still remains what he best describes when he calls himself a "lord of language." The book abounds in gems of phrase and paragraph, and furnishes page after page which tempt quotation. He traces the various stages of suffering through which he has gone, and lays utterly bare the inmost sacred places of his soul, taunting the world to scoff if it dare. Here, for instance, is his own verdict upon himself:

"I will not say that prison is the best thing that could have happened to me, for that would savour of too great bitterness towards myself. I would sooner say, or hear it said of me, that I was so typically a child of my age, that in my perversity, and for that perversity's sake, I turned the good things of my life to evil, and the evil things of my life to good."

Of his sufferings he says:

"I have lain in prison for nearly two years. Out of my nature has come wild despair; and abandonment of grief that was piteous even to look at; terrible and impotent rage; bitterness and scorn; anguish that wept aloud; misery that could find no voice; sorrow that was dumb. I have passed through every possible mood of suffering, and while there were times when I rejoiced in the idea that my sufferings were to be ended, I could not bear them to be without meaning. Now I find hidden somewhere away in my nature something that tells me that nothing in the whole world is meaningless, and suffering least of all. That something hidden away in my nature, like a treasure in a field, is Humility."

The great question before the reader in such a book as this is its sincerity. Throughout the book one reads promise of regeneration when the prison days should be over, and in reading these there is the tragic story of the writer's last years which rises up at least to show how futile were such hopes. Yet artist as he was, with all the artist's regard for mere expression as the supreme and only mode of life, he was perhaps fully satisfied to have written down such passages as these. Speaking of his release from prison, he says:

"Society as we have constituted it will have no place for me, has none to offer; but nature, whose sweet rains fall on just and unjust alike, will have clefts in the rocks where I may hide, and secret valleys in whose silence I may weep undisturbed. She will hang the night with stars so that I may walk abroad in the darkness without stumbling, and send the wind over my footprints so that none may track me to my hurt; she will cleanse me in great waters, and with bitter herbs make me whole."

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Views of the Sixties

One wonders, upon reading the two volumes of *Essays* (Murray, 6s. net each) contributed to the *Quarterly Review* by the late Lord Salisbury during the early sixties, if the writer authorised their appearance, for they are heavy with the dust of ancient periodical literature. The slightest excursion into these pages easily shows that the Lord Robert Cecil who wrote them was a very different man from the Marquis of Salisbury so lately a leading figure in British public life. If the Essays, particularly those dealing with foreign politics, lack the gravity and responsibility of later utterances from the same pen, they atone by a more energetic spirit of youth and irresponsibility. Unlike other great English statesmen, to whom it has become an unwritten law that the party faith of their youth should appear abominable to their age, Lord Salisbury began as that peculiar type of Tory which is perhaps best described by calling him a Cecil Tory; but to him age brought, if possible, a firmer crystallisation of political belief. Through all his criticism of the policy of the then Foreign Minister (Earl Russell), there constantly peeps out the Tory's bitter scorn for Democracy or Radicalism in any form—doubly interesting in view of the Tory Democracy of which we heard so much during the latter days of his last Premiership. So frequent are the statements which have a curious misapplication to the affairs of to-day that we doubt if Lord Salisbury would have consented to the republication of the Essays in question. One of the volumes contains biographical studies of Castlereagh and Pitt, the latter based upon the appearance of Stanhope's Life. The other is devoted wholly to Foreign Relations, and contains essays upon the Polish Revolution, the war over the Danish Duchies, and a general condemnation of Earl Russell's administration, under the title of Foreign Policy.

In the Castlereagh, it is natural to find the young Tory defending rather strenuously the memory of England's strong man in the Holy Alliance. There are bound always to be two views of Lord Castlereagh's character, just as the world seems to be inevitably divided into Whigs and Tories. But many of the exemplary references of 1862 seem strangely out of date. For instance, in praising Castlereagh's arbitrary disregard of national aspirations at the Congress of Vienna, it is rather strange to read that his union of Norway and Sweden has formed as contented and as prosperous a people as any on the Continent. Surely, in view of the situation to-day the author would have edited this paragraph out had he superintended its republication. There is a curious little mischance arising from the fact that the frontispiece for the biographical volume is a beautiful drawing of Lord Salisbury's head by Richmond. For in the first chapter upon Pitt he says that "Lord Stanhope's kindly judgments and rosy views are very agreeable reading and leave pleasant illusions in the mind, just as a Richmond head is pleasanter to look at than a photograph, though one may not be able to repress the consciousness that it over-flatters the grim human reality." No one who is acquainted with the strong, yet always forceful, English which Lord Salisbury continued to write even for his latest Blue Books will fail to understand what a fund of attractive phrases and pointed paragraphs these volumes contain.

A French Imperialist

Mr. Rudyard Kipling has taken words out of the reviewer's mouth in the letter which he has written, by way of an introduction, to an entirely delightful book by Vicomte D'Humières, called *Through Isle and Empire* (Heinemann, 6s.). If it were not ungracious to use the epithet, the author seems that rarest of rare birds, a French Anglomaniac. As Mr. Kipling says, there are few things more interesting than to see one's own country from without, and eyes that are as penetrating—and as merciful—as the Vicomte's make the interest a keen pleasure. He has not only had the advantage of an introduction by the high priest of Empire, but has been excellently served by a translator in the person of Mr. Alexander Teixeira de Mattos. The book is more than the ordinary record of a French tourist in the Mother Country and the Colonies. It may be a little more popular, because it is for the most part flattering, but there is blame and sharp criticism often enough to relieve the book of the tedium of fulsome praise. In a very serious introduction, Vicomte D'Humières presents a noteworthy study of the island-empire from the Frenchman's point of view; and if this is a little heavy at times, it should not discourage the reader from progress towards the attractive travel notes that follow. The book is divided into four parts—England, Egypt, India, and the Deccan. The only fault one finds with the book is that in the part which relates to England itself the author combines the notes of several visits extending over a period of years without any indication that they lack

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chronological sequence. Otherwise it is a very comprehensive picture by one who seems to have enjoyed every sort of social advantage, of England in war time, during the coronation festivities, of its society, its sport, its country houses, its manners, and many of its great people, including a chapter devoted to a visit and interview with Mr. Kipling himself, by whom, as we have said, the book is best reviewed. He says :

" From the point of view of an inhabitant, I am specially delighted with your tributes to the energy of the race, a thing which some of us at times to-day begin to doubt. There exists—I am glad you did not see it—an England which, ruined by excess of comfort, has gone to sleep and, because it snores loudly, believes that it is thinking.

" Your comments on the Army seem to me very just. Above all, you have put your finger upon one vital point of our training when you speak of the men who 'understand that they must not understand.' I think that is at the bottom of many of our successes and our failures. It is the first thing which we teach our boys.

" Believe me, I agree most cordially with all you say on the value of a good understanding between our countries ; and this not only for the need of to-day, but for the hope of to-morrow. The two lands, so it seems to me, supplement each other in temperament and outlook, in logic and fact. Even if this were not the case, we must remember that there is not so much of liberty left in Eastern Europe that the two leaders of Freedom should dare to dispute between themselves. We both have to deal with the 'unfrei' peoples, the veiled and cramped lands where the word of a king is absolute power. If we should quarrel, who will profit ? The Middle Ages with the modern guns. Isn't that true ?

" If I could see you, I could discuss more at ease than here a thousand interesting matters in your book. Notably what you have observed of the national coolness of temperament. No; our 'chastity' is not all cant. It is an administrative necessity forced upon us by the density of the population. Imagine a land with four hundred people to the square mile—if they were penetrated with a refined and enduring sensuality ! It would be an orgy ! It would impede traffic. Consequently, we are brief and businesslike in such matters. Also it is a meat-fed people, of whom 6,000,000 (or more than one-seventh) live in a city which, for five months of the year, swims in semi-obscurity alternating with profound darkness. We realise that this is exciting to certain nerve-centres, and we—the land—take exercise to counteract the stimulus. 'We understand that we must not understand.' To understand everything may be to pardon everything, but it also means to commit everything."

Here is the passage which Mr. Kipling speaks of, a criticism of British soldiers in consequence of a conversation in a train with soldiers home on leave from the war in South Africa :

" They are proud of that one too, as of the others. They are proud of him on principle, because you must be proud of something when you're an Englishman ; they are proud, first, because they do not understand and, next, because they understand that they must not understand. A profound instinct warns them against intelligence, the enemy of action. They have a dim presentiment of the dangers of analysis. If it is bad to be led by incapable commanders, it is worse to know it, for that makes them no better, and they are obeyed with less self-denial. They could, no doubt, be changed ; but commonsense suggests that the new ones would not differ perceptibly from the old. This is how the men argue, these men in whom the hierarchical sentiment, social as well as military (M. Chevrillon, in his excellent articles in the *Revue de Paris*, gave, among other reasons for General Buller's popularity, his quality as a country squire), does not exclude the sense of solidarity. This state of mind among the combatants appears enviable beside that which would undoubtedly prevail among French soldiers in similar circumstances : every order discussed, suspected, jeered at ; the personality of each superior officer pitilessly judged ; every strategical movement submitted to the criticisms of camp-fire Jominis ; and all under the irritating suppression of an ill-conceived system of discipline, which has slain initiative, but begotten jealousy and discontent."

From England in the depths of war and woe to England in the heights of coronation joy—and woe also—is but a brief step, and the French visitor has a keen eye equally for the sad and for the brightly coloured picture. Here is how he describes the thunderclap of the King's illness :

" Never was stage effect led up to with more perfect art and care than the news that burst this afternoon over thunder-struck London. One has not even the courage to reproach fate with her too easy blows : the catastrophe descends totally unforeseen, at the culminating moment of the play.

" The scene passes in an immense dining-room, hung with admirable Gobelins and Coypel. The French windows look out over terraces, pieces of water, lawns, a great park of seventy acres in the heart of London. There are two tables : at one, the mistress of the house has the Grand Duke of Hesse on her right, an empty chair on her left ; at the other, the host is seated beside the Duchess of Connaught and the princesses, her daughters. The conversation, made up of

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commonplaces, lags, weighed down by I know not what dull anxiety, which is certainly more or less clearly defined according to the degrees of initiation of each guest.

"Suddenly, a footman bows to whisper to the host, who rises, goes out and returns a moment after, ushering in the Duke of Connaught, pale, in a general's uniform, bringing the news: the coronation is postponed!

"To his preoccupations as a family-man and a model brother is added the care of 59,000 soldiers to provide for. No smaller number has come to these rejoicings, which a brutal destiny countermands. . . .

"But the real pathos of the situation is not revealed until we enter the swarming streets outside, gaudy with shields and banners which will not be used, and one must needs feel an emotion of deep sympathy for this great people, at the sight of the peculiar eloquence that now attaches to the inscription a thousand times repeated on the house-fronts and triumphal arches: 'God Save the King!'"

The book is full of apt quotation, even where it deals with England alone, but the critic is as kind and as keen when he goes to visit the Viceroy of India, or watches the wedding of the Lion to the Sphynx.

The Alien Invader

It is perhaps natural as the United States has been for some years grappling with the problem of undesirable immigration, that Yankee prophets should arise to aid us in the understanding of what has lately become a pressing question here. It is easy to understand, therefore, why a volume by Mr. James Davenport Whelpley, *The Problem of the Immigrant* (Chapman and Hall, 10*s.* 6*d.*), should be much more comprehensive than any similar study of the question which has appeared in this country. Mr. Whelpley has contributed a series of studies to various reviews, including the American edition of *The World's Work*, some of which appear in this volume, representing the result of a year's study in thirteen European countries. The book purports to be briefly a discussion, with a summary of conditions and laws and regulations governing the movement of population to and from the British Empire, the United States, France, Belgium, Switzerland, Germany, Italy, Austria-Hungary, Spain, Portugal, the Netherlands, Denmark, Scandinavia, and Russia. Considering the difficulties in the compilation of such a book, the different languages involved, the widely scattered statutes, Government decrees, and police regulations in the various countries, there is no doubt that Mr. Whelpley has compiled a book invaluable to any student of the problem. The author says that no pretence is made that the discussion and data begin to cover the great field in the subject treated, nor is the book to be considered a technical law book, as the legal phrase is merely outlined in the attempt to give some information as to the laws now in force and under consideration. But the general reader need not imagine that the book is as dry, or is lacking in picturesque interest, as this summary might indicate. The vast and endless army for ever marching out of remote and little-known regions of Northern, Eastern, and Southern Europe is a modern *hegira* full of amazing possibilities. Nondescript but never changing in character, lacking leaders or any definite organisation, this great force, moving at the rate of nearly one million and a half each year, is invading the civilised world. To quote Mr. Whelpley:

"Like a mighty stream it finds its source in a hundred rivulets, the huts of the mountains and the hovels of the plains are the springs which feed it; the fecundity of the races of the old world, the inexhaustible source. It is a march the like of which the world has never seen, and the moving columns are animated by but one idea—that of escaping from evils which have made existence intolerable, and of reaching the free air of countries where conditions are better shaped for the welfare of the masses of the people. It is a vast procession of varied humanity. In tongue it is polyglot; in dress all climes from pole to equator are indicated, and all religions and beliefs enlist their followers. There is no age limit, for young and old travel side by side. There is no sex limitation, for the women are as keen as, if not more so, than the men; and babes in arms are here in no mean numbers. The army carries its equipment on its back, but in no prescribed form. The allowance is meagre, it is true; but the household gods of the family, sprung from the same soil as a hundred previous generations, may possibly be contained in shapeless bags or bundles. For ever moving, always in the same direction, this marching army comes out of the shadow, converges to natural points of distribution, masses along great international highways, until its vanguard disappears, absorbed where it finds a resting place."

The chief purpose of this book is to provide information for those who would police the world and regulate and restrict this ever-growing flood. This, of course, can only be accomplished by international action; and Mr. Whelpley, together with all other students of the problem

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of the immigrant, makes a strong appeal for such a mutual agreement as will be conducive to the safety, happiness, and prosperity not only of the weak but also of the strong, not only of the oppressed but also of the free.

"To the Women with Red Hair"

Mrs. Glyn has a large circle of readers who will hasten to get hold of her new book, *The Vicissitudes of Evangeline* (London: Duckworth, 6s.). Evangeline is another young lady of the type of Elizabeth and Ambrosine—ravishingly pretty, entirely unconventional, not over-scrupulous, and very human. Her physical attraction consists in the irresistible combination of red hair and green eyes, shown in a striking miniature as a frontispiece—a portrait in which many people will doubtless recognise the author herself, plus a crown of red hair. The story of her vicissitudes is amusing and sparkling, it is filled with descriptions, more or less true, of a certain section of the society of to-day, it is un-moral (not immoral), and it makes Evangeline, in spite of everything, a very attractive young person. Most novel-readers will begin the book, few who begin it will fail to finish it, and all who finish it will talk about it. Thus will the objects of authoress and publisher be fulfilled.

A Living Memory

It is seldom that such a slender literary output as that left by the lady who called herself "Michael Fairless" at the time of her early death has secured such widespread acceptance and permanent popularity. There seems to have been no end to the sale of a small volume of essays called "The Roadmender," which, together with a short story, "The Gathering of Brother Hilarius," were the only books the young author published. A third volume now makes its appearance, *The Grey Brethren* (Duckworth, 2s. 6d. net), a gathering up of fragments in prose and verse, the literary remains, in fact, of a personality distinctly apart. The title-story has to do with Quakers of the old school, and perhaps a brief extract of description will give the best idea of the author's style:

"Some of the happiest remembrances of my childhood are of days spent in a little Quaker colony on a high hill. The walk was in itself a preparation, for the hill was long and steep and at the mercy of the north-east wind; but at the top, sheltered by a copse and a few tall trees, stood a small house, reached by a flagged pathway, skirting one side of a bright, trim garden. I, with my seven summers of lonely, delicate childhood, felt, when I gently closed the gate behind me, that I shut myself into Peace. The house was always somewhat dark, and there were no domestic sounds. The two old ladies, sisters, both born in the last century, sat in a cool, dim parlour, netting or sewing. Rebecca was small, with a nutcracker nose and chin; Mary, tall and dignified, needed no velvet under the net cap. I can feel now the touch of the cool dove-coloured silk against my cheek, as I sat on the floor watching the nimble fingers with the shuttle, and listened, as Mary read a large letter received that morning, describing a meeting of the faithful and the 'moving of the Spirit' among them. I had a mental picture of the 'Holy Heavenly Dove' with its wings of silvery grey, hovering over my dear old ladies, and I doubt not my vision was a true one. Once as I watched Benjamin, the old gardener—a most stiff-backed Friend, despite his stoop and his seventy years—putting scarlet geraniums and yellow feverfew in the centre bed, I asked, awestruck, whether such glowing colours were approved; and Rebecca smiled and said: 'Child, dost thee not think the Lord may have His glories?' And I looked up from the living robe of scarlet and gold to the dove-coloured gown, and said: 'Would it be pride in thee to wear His glories?' and Mary answered for her: 'The change is not yet; better beseems us the ornament of a meek and quiet spirit.' The change from 'glory to glory' has come to them both long since, but it seems to me as if their robes must still be Quaker grey."

There are several little gems of short stories, some poems not so good, and some quite delightful fairy tales written down as they were told by word of mouth to one child and to another of widely differing ages.

Amusing Enough

The great things which were expected of Mr. Percy White seem somehow yet unrealised. The quiet distinction, the reserve, the light wit which characterised the first of his novels is still to be found in *The System* (Methuen, 6s.). But there seems little advance in the art of the satirist, and Mr. White has by no means yet reached the first place in the domain of Thackeray. His story as a story is amusing enough, and concerns the Radical proclivities shown by the eldest son of a perfectly respectable, if rather sporting, county family. No one who knows how strong are the conventions of county life in England can fail to sympathise with the family whose first-born engages in Radical village meetings and riots, who seeks to overthrow religious as well as social orthodoxy, and finally publishes in London a paper called

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"The Sentinel," whose aim is not the protection, but the destruction of the existing order of things. Mr. White's hero is rather a harmless fool, moved by the best of good intentions, who through no virtue of his own comes to a happy end.

Some Good Short Stories

There is an undeniable charm about the work of Mrs. Gertrude Atherton, even where it offends the most—for offend it often does, both in turn of phrase and in subject-matter. As to her phrases, these may have only an American form which strikes English eyes as uncouth. The subject-matter is often shocking by choice, as in several of the short stories in her latest volume—*The Bell in the Fog* (Macmillan, 6s.). The book is dedicated to him whom she hails as "The Master—Henry James," and quite appropriately, for he figures almost without disguise as the leading character in the title-story. This is a queer haunting study of a child, the reincarnation of a seventeenth-century belle who lived and died violently. It is very well done and has nothing of the shilling shocker about it. So much cannot be said for the second story—"The Striding Place." This is horrible enough to be a nightmare and certainly should not be read by nervous people late at night.

Mrs. Evans Gordon, if, as I think, her book *Amanda Penfold and Other Stories* (London: Simpkin Marshall), is a first effort, shows a very promising turn in fiction. The book contains three stories, one of which, the title-story, shows genuine local colour and an unusual accuracy of simple conversation. There is no lack of imagination in all the stories, which hold the reader's attention to the last page. Mrs. Evans Gordon is right to write fiction, and I shall look with interest for her next work. It ought to be a novel, for the larger and broader her canvas the better would her gifts be exhibited.

Stray Remarks, Collected

In all friendliness, we fear that Mr. George Street courts the blame he discourages in his preface to *Books and Things* (Duckworth, 6s.). He urges that upon the appearance of a former collection of stray papers, reprinted from the periodicals, he was kindly encouraged by the critics, and he seeks, therefore, to throw upon them the blame, if blame there be, for his persistence in reproduction. If Mr. Street were any other than he is, perhaps one might be grateful for the volume of cheery little essays here collected. They treat very slightly even of the slight subjects indicated, and were, we fear, for the most part "things" which might well be left to twinkle in the dim, back-number pages of the several magazines and reviews mentioned in his preface note of acknowledgment. Perhaps any book of periodical reprints conveys the idea of literary indolence, and the reader is disposed to demand fresh matter and fresh labour for the dignity of a bound volume. The old band of admirers of Mr. Street's work have so often prophesied for him great things that they begin to fear perhaps their own reputation as prophets. For in spite of the charm of style which still remains with him, the force of matter seems extraordinarily lacking in this book. Perhaps the chapters which treat of books are better than those treating of places and of things, but one fails to find much other than a pleasant sort of journalistic comment which other folk would never dream of resurrecting. One of the best chapters is that upon the amazing memoirs of Mr. Thomas Creevey, but even here Mr. Street grows a little preachy to the loss of his old-time gaiety. Speaking of this *confidante* of kings, he says:

"I take leave of my pleasant gossip a little saddened at the end. For though we may dig up more of his like, I doubt if any one living is preparing a rivalry with him. We push more, and have less leisure generally, it may be; but I fancy that the Creevey type of man, the man who was in, and of, the most important political or other life of the time, but had leisure from his own advancement to observe and write down, is too scarce. Also, I fancy that the society he describes, where social gifts were still valued for their own sake, and money was less of an open sesame anywhere, must have been more agreeable, on the whole, than any general society we are likely soon to see again. I began by noting our increasing richness in old letters and diaries; I would end by hoping that the increase may continue. When we see, I forget how many thousand, new novels come out every year, novels which are, for the most part, the superfluous creation of imaginary dullards in a world that is full of real ones, we may surely find room for more of these genuine records of interesting life."

A Romance of the Slave States

Mr. Charles P. Plant, whose former novel of the Commonwealth called "The King's Pistols" was so favourably received, has chosen quite another field for his latest romance, *John Rigdon* (Swan Sonnenschein, 6s.). His hero is the son of a Mississippi planter who had married a slave-girl in 184–. The son was educated at

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Oxford, only returning to America on the death of his father to find that owing to legal mistakes his mother and himself were slaves and therefore paupers. The sad and thrilling experiences of such a man are set forth with moving detail in the widest of side pictures of the bitterness of life in the slave States in the few years preceding the Civil War. Mr. Plant has written a notable book upon a subject so full of difficulties as to frighten even the boldest pens.

A Dog Book

No one who has a dog or who thinks of keeping a dog, should be without a copy of *The Kennel Handbook*, by G. J. Davies (John Lane, 3*s.* net), a most useful little book full of hints and instructions upon buying, feeding, breeding, training and nursing dogs. Its great feature is the simplicity with which everything is explained, so that even the most ignorant of dog lovers can understand and profit by its teaching.

A Necessary Year Book

It is strange how quickly innovations become accepted necessities. Only a few years ago we seemed to get along very well without yearly information as to the condition of the various municipalities of the United Kingdom; but through the energy and ability of Mr. Robert Donald, the editor of the *Municipal Journal*, and later of the *Daily Chronicle*, we have come to look annually as a matter of necessity for *The Municipal Year Book* (Edward Lloyd, Ltd., 3*s.* 6*d.* net). Like other annuals, this grows in size, in information, and in value each succeeding year, and the volume for 1904 shows a marked improvement in re-arrangement for prompt and comparative reference. It embraces sections upon Municipal Government, Water Supply, Gas, Tramways, Electricity, Housing of the Working Classes, Markets, Telephones, Baths and Washhouses, Education, Libraries, Cemeteries, Refuse and Sewage Disposal, Local Taxation, and Municipal Trading. It is, in short, comprehensive and unfailingly useful.

OUR ACCOUNTS WITH LIFE

FEWER BIRTHS, FEWER MARRIAGES, FEWER DEATHS IN ENGLAND AND WALES — CONSUMPTION STILL A GREAT SCOURGE — INFANTILE MORTALITY DECREASING—STRIKING FIGURES FROM THE REGISTRAR-GENERAL'S REPORT

SOMETHING was heard a few months ago of a laudable movement for rendering more popular the information buried in the numerous valuable Blue Books and official reports which emanate with unfailing regularity, if not indeed punctuality, from the press of his Majesty's Stationery Office. The idea was that the contents of these volumes might be presented in a more attractive guise in order to catch the attention of the general or the hasty reader. We could imagine the result were the Registrar-General's Report of Births, Deaths, and Marriages subjected to such a process. There would be half a dozen or more convenient little pamphlets, with titles bearing evidence that the ready art of the modern newspaper-writer had been called into requisition. We should have "The Marriage Handicap" certainly for one; "The Disease that kills most" for another; and the statistics of the birth-rate would be a prolific source upon which wit and alliteration would be spent freely for the benefit of a public which insists more and more upon getting at the gist of a matter quickly and decisively. One thing, however, cannot be in doubt, and that is, that the Blue Book in the form before us is not inviting to the ordinary man or woman. The subject-matter, which in small doses might be tolerable, is heavy to contemplate when presented thus. Precise, faultless, cold, it is a great record of the burden of living and the burden of dying from which the average person shrinks as from something unpleasant. There are few reliefs from its note of formal seriousness, and these few have to do with such incidents as the admonition of doctors whose use of the name "Rubeola" in medical certificates, to denote the familiar disease, measles, still continues to cause uncertainty in the Statistical Department. On the whole, the 2*s.* 2*d.* which the Book costs is not likely to be spent except by the medical specialist and the particular student of social

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tendencies, to whom the Registrar-General's Report for 1903 is deeply interesting. Others will find in a summary such as we now give all they care to know.

An important, perhaps the most important, statement is that the birth-rate in England and Wales in the year 1903 was the lowest on record. The population of England and Wales in the middle of that year is estimated at 33,378,338 persons, of which 16,133,344 were males and 17,244,994 were females. The births numbered 948,271, or at the rate of 28.4 per 1000 of the population; being 0.1 below that in 1902 and 1.0 per 1000 below the average in the ten years 1893–1902. These figures are more significant when it is added that the birth-rate has been gradually decreasing ever since 1895, when it was 30.3 per 1000. It is pointed out, however, that the total population is not the most satisfactory standard by which to measure the birth-rate, because it does not take account of the age constitution of the population, and particularly the age constitution of the female population of conceptive age. Adopting this method, the Registrar-General finds that the proportion of births per 1000 women aged from fifteen to forty-five years was 113.8, which reveals a steady decrease as compared with 114.8 as the average annual rate in the period 1900–1902, 129.7 in 1890–1892, 147.7 in 1880–1882, and 153.7 per 1000 in 1870–1872.

To return to the number of births in 1903, it is shown that the male births (482,229) were to the female births (466,042) in the proportion of 1035 to 1000, which is almost exactly what it had been for ten years before. Carmarthenshire boasted 968 male births to 1000 female, while at the other end of the scale came Suffolk and Wiltshire with 1059 boys to every 1000 girls. The number of illegitimate births in the year was 37,302—in other words, 39 out of every 1000, which is a reduction of 2 per 1000 as compared with the average in the preceding ten years.

The United Kingdom deplores a falling birth-rate in the past ten years in common with the Colonies and foreign countries. In France, for example, the rate has fallen steadily from 26.7 of the population in the year 1872 to 21.1 (or 7.3 lower than England and Wales) in the year 1903. Italy's birth-rate in 1903 was 31.5, compared with an average of 34.3 for the previous ten years; Prussia, Norway, and Denmark had both fallen by 2 per 1000. Spain rose to 36.4, as compared with 34.8; while the Colony of Ceylon had a rise from 30.2 in 1892 to 40.0 in 1903. In England and Wales and in Belgium, with average birth-rates of 29.4 and 28.9 per 1000 of the population, the average rates of infantile mortality in the ten years were 152 and 157 per 1000 births respectively. The fact that in 1903 the rate in England and Wales was 132 per 1000, or 20 per 1000 below the above average, is attributed to the cool and wet summer of that year.

The declining popularity of marriage is less serious than the declining popularity of babies. During the years 1893–1902 the average number of marriages in England and Wales annually was 15.7 of the population. The rate for 1903 was only .1 per 1000 fewer, the total number being 261,103. It is interesting to note that the proportion of marriages in the Established Church was 10 per 1000 fewer than in the previous year. On the other hand, there was an increase in the proportion of marriages in Nonconformist churches, and of civil marriages in registrars' offices. The proportion of Roman Catholic marriages was the same as in 1902, while the proportion of Jewish marriages (64 per cent. of which took place in the three districts of London City, Whitechapel, and Mile End Old Town) which had steadily increased for many years, showed a slight decrease in 1903. Of every 1000 marriages 651 took place in Established churches, 130 in Nonconformist churches, and 41 in Roman Catholic churches; .4 in Quakers' meeting houses, and 170 at Registrars' offices. Of every 1000 men who married 912 were bachelors; of every 1000 women 934 were spinsters. The proportions of remarriages, both for widowers and widows, were the lowest on record. In fourteen cases divorced men married divorced women.

The number of minors who married in 1903 touched the lowest point for over fifty years. Only 46 in every 1000 of the husbands and 152 in every 1000 of the wives were minors. In this connection it is instructive to turn for a moment from the Registrar-General's weightier volume dealing with England and Wales in 1903 to the medical officer's report on the health of Tottenham during 1904. In that urban district at least, it seems, there is room for improvement in this matter of boy and girl marriages. Dr. Butler-Hogan, the medical officer of health, ascribes to them a large responsibility for the death-rate of infants, as well as for the poverty of certain quarters in Tottenham. His words are worth quoting, as they represent a large

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body of informed but not often expressed opinion upon this subject:

"It appears to me [he says], that the Red Indian is not such a fool as many of his brethren in English towns; he chooses a woman for his squaw who can cook his food, suckle his children, make his mocassins, and even repair his wigwam. The wretched lad of our towns marries a tawdry slut who can, as a rule, do none of those things, or what corresponds to them in 'civilised' society. The savage of the prairie is truer to the animal; the savage of the pavement falser to the man. The first is more consistent to himself and his surroundings; the last is an anomaly which only the witches' cauldron of the perverted civilisation could concoct. From this class it is that those children proceed who are 'bold, pert, and dirty as a London sparrow,' who are precocious in all the 'smart vices' of a new century, who 'cheek the gov'nor,' who despise or ignore 'th' old woman,' who tolerate their teachers, who abhor their superiors, and who in a word are hopelessly wanting in the old-fashioned virtues of truth, courtesy, and reverence. Thence we get the deserted or neglected urchins who learn to 'look sharp,' and whose vocabulary is of the uncouthest and foulest, who can give you the latest tips, and whose general wickedness only grows with their growth. These are the babes fed upon gin instead of milk, and fed upon gin even *through* their mother's milk. Can we wonder that when a hot dry summer comes such babies fall an easy victim to the attacks of epidemic diarrhœa?"

Roughly speaking, and counting the population over fifteen years of age, it is shown by the Registrar-General that in England and Wales 54 bachelors marry to-day where over 55 married twenty years ago; 52 spinsters as compared with over 56; 40 widowers as compared with 58; and 13 widows as compared with 18. The decrease has, therefore, been considerably greater among widowers and widows than among the unmarried of either sex; a fact which cynics may hold to give colour to the assumption that "such as are in the institution wish to get out, and such as are out wish to get in." On the whole, the marriage rate is not depressingly low.

But if there is a decrease in births and a slight falling off in the number of marriages, it is highly gratifying at least to discover a considerable decrease in the number of deaths. The rate has steadily fallen for fifty years, having been 23.5 per 1000 in 1854, and only 15.4 in 1903. This is the lowest rate on record ("on record" means since the inauguration of civil registration in 1837). Among males the rate was equal to 16.5 per 1000, and among females to 14.4 per 1000—these rates being below the corresponding average rates for the previous five years by 11.1 and 11.6 per cent. respectively. The causes of death are set forth in this report, like all the other statistics, in carefully compiled tables. The number of deaths in the year was 514,628, comprising 266,290 males and 248,338 females. As illustrating the great reduction of mortality in the earlier years of life it is pointed out that the death-rates both of males and of females at ages between five years and twenty-five were approximately only 40 per cent. of the corresponding rates in the "good old times" represented by the years 1841 to 1850. Seventeen of the men and thirty-six women who died in 1903 were reputed centenarians. Consumption was responsible for 1203 deaths per million of the population; various forms of pneumonia for 1220; bronchitis 1112; heart disease 823; diarrhœa 542; Bright's disease 283; measles 374; influenza 189; diphtheria 133; scarlet fever 125; and enteric 100. With regard to these figures it should be noted that the deaths from consumption are only three-fifths of the number twenty-five years ago. Cancer, on the other hand, caused more deaths than before, the number of its victims being 29,089, or 2795 more than the average number in the previous ten years. In other words, this means that in the year 1903 cancer carried off 732 per million among the males and 1003 per million among the females. The information with regard to international vital statistics, which forms so valuable a section of the Registrar-General's report, shows unhappily that we share this tendency to an increased death-roll from the cancer foe with our neighbours, chiefly Austria, Prussia, and Italy.

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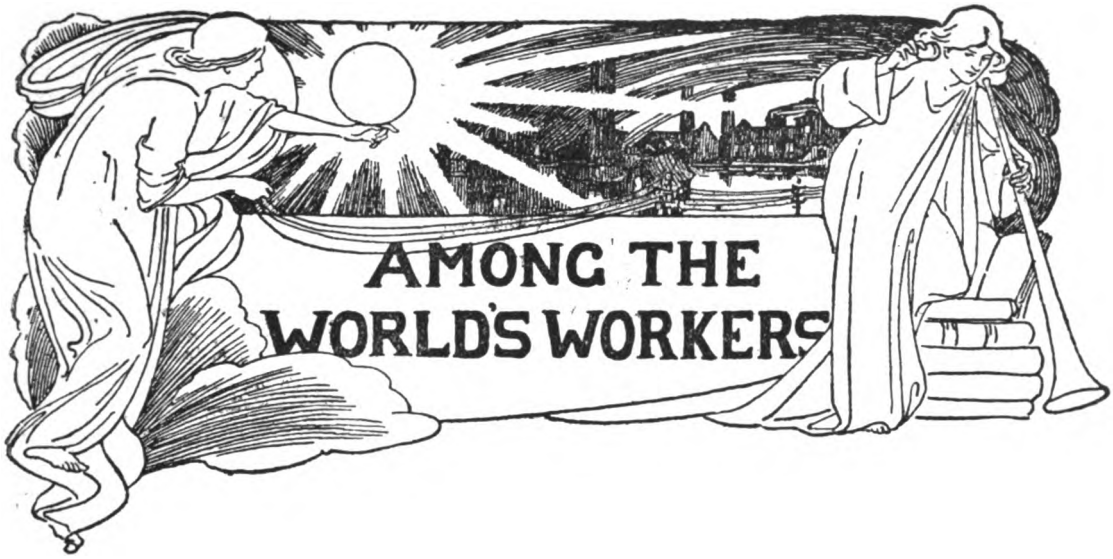

ADVERTISING THE ARMY

IN his report for the year ending September 30 last, Major-General Miles, the Director of Recruiting and Organisation, states that in some districts prejudice still exists against service in the Regular Army. This is shown in various ways. For example, influence is sometimes brought even from the pulpit against the work of the recruiter. In other cases exhibitions purporting to represent incidents in the life of a soldier are calculated to cast ridicule on his Majesty's Service. Such instances have been brought to notice and a circular was sent to General Officers Commanding, requesting them to instruct Commanding Officers to ascertain before in any way giving assistance to public entertainments that they contain nothing of a character likely to cast ridicule on his Majesty's uniform or give a false impression of the Service. It may be, adds General Miles, that the injury done by such exhibitions was not intentional, but its effect is none the less real. The work of recruiting might be facilitated by Parliament. In the future it is probable that advertisement will be largely resorted to for recruiting, and may go far to supersede existing agencies. If provision were made that advertisements connected with the Army and the Navy must be exhibited in the case of the railways at each station on the line, considerable assistance, the Director states, would be given to the recruiting authorities, and the space occupied would be small. At present, in the case of the large railways, the whole of the advertising space at any station is let off to some large advertising contractor, and with the small sum voted for advertising for recruiting for the Army the cost of displaying advertisements at railway stations is prohibitive.

The importance of civil employment in attracting young men of a higher social class to the Colours is laid stress on by several officers commanding regimental districts. In connection with this subject it will be observed that only nine appointments have been filled during the year in Government Offices outside the War Office, while the number of ex-soldiers employed in Departments under Government shows a material diminution. This question is not a new one, but it will not be satisfactorily solved until seriously taken in hand by Parliament. It is of vital importance for recruiting and for the attraction of a better class of recruit that employment shall be secured to deserving soldiers on leaving the Colours.

In view of these facts, says the Director, it may be hoped that instructions will be issued that vacancies in Government Departments shall be filled by suitable ex-soldiers if possible, and only from outside sources when no suitable military candidate is forthcoming.

The number of recruits who joined the Regular Army, excluding Colonial Corps, for the twelve months under review amounted to 41,279, and for the Militia 35,264.

MARGARINE FOR BUTTER

PROFESSOR JAMES LONG contributes to the March number of our new and vigorously conducted contemporary the *Grand Magazine*, an article on "Trade Swindles," in which he shows how every day unscrupulous tradesmen cheat the public. Fraudulent imitations, he says, are found in almost every trade, and among goods of almost every class—food, clothing, furniture, and the general equipment of the house and the home. Every variety of food common to the table is on the market as an imitation, or is adulterated; or if in other respects genuine it may be an imported article sold as British and at British price. Professor Long makes his revelations not only in the interest of the breadwinner and the housewife, but also of the honest tradesman who would scorn to be guilty

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of such tricks. With regard to butter, for example, he says probably not 5 per cent. of those who eat it know anything of its character and composition. Butter is the fat of milk, with which some 12 per cent. of water is necessarily combined in the process of production. An ingenious person discovered the fact that a cheap fat, such as the "oleo" obtained from the refuse fats of animals slaughtered in the Chicago stockyards, which at the time possessed but a nominal value, could be prepared and mixed with genuine butter in such a way that the consumer would be unable to recognise it. Thus an article, probably costing 3*d.* a pound, was sold at four or five times its actual value; and so it is to-day that margarine, which is the finished product of the "oleo," is blended with butter so skilfully that the analyst fails to detect it, and as a consequence the "cheat" evades the very imperfect law of the land. So capable an expert as Professor Long states that he has on two occasions prepared samples by blending butter and margarine in given proportions on behalf of one of our large associations for the purpose of obtaining evidence, with the result that analysis was entirely at fault. In Belgium and Germany it is incumbent on the margarine-maker to add an infinitesimal quantity of a harmless material to their product which is easily recognised by the analyst, so that if mixed with butter the fraud is at once detected. The buyer is safe in purchasing butter from the farmer; but while Irish butter sent out by the co-operative creameries and Danish butter are beyond suspicion, nothing must be taken for granted where either passes through the hands of those to whom malpractices are as the breath of their nostrils. If, however, a sample is free from margarine, it may still be loaded with water to the extent of 25 per cent. or even more, and water is a prolific source of profit.

MANUEL GARCIA AND THE LARYNGOSCOPE

MANUEL GARCIA was born in Madrid, on March 17, 1805. His father was both a composer and a singer who had travelled through Europe and America before settling down with his family in Paris. The three children were all destined to become celebrities in their turn: Marie Garcia, better known as la Malibran, Pauline, the incomparable interpreter of Glück, known in every part of the world as Madame Viardot, and Manuel who devoted himself to the teaching of singing. In 1835 he was appointed professor at the Paris Conservatoire and a few years later he settled in London. In 1840, Manuel Garcia submitted to the French *Académie des Sciences* a work of his on the functions of the larynx. Some celebrated physiologists were appointed to study this work of Garcia's, but nothing more appears to have been heard of it

In 1855 Garcia, through Sharpey, submitted to the Royal Society of London his "Observations on the human voice." In a few lines Garcia explained his system of examining the larynx by means of a glass reflecting the light. This was nothing more nor less than the laryngoscope which is now in use with the electric light. It is possible that the Royal Society might have taken no further notice of Garcia's treatise, but fortunately Cryermak, of Vienna, realised what this method might mean in future work. He made a study of it, and applied it to pathological cases, and this was a revolution in the study of many questions connected with the throat and larynx.

Garcia's name is associated with his method of training the voice, but comparatively few people have realised hitherto all that the world of medical science owes to him.

AN IMPERIAL COMMERCIAL SERVICE FOR COLONIES

MR. C. F. JUST, a commercial representative of Canada in this country, recently read a paper before the Society of Arts, on the manufactures of the Dominion, in the course of which he made an interesting suggestion for the establishment of an imperial commercial service for the colonies. His proposal is that means should be taken to perfect the colonial organisation of the new Commercial Intelligence Office of the Board of Trade, by creating a service of Commercial Agents to reside in the British possessions, these agents to report at frequent intervals through the Colonial Office to the Board of Trade on all matters concerning the resources, growth, local enterprises, public contracts, openings for trade, and the investments for capital, as is now done by H.M. consular officers and the special commercial *attachés* and commercial agents in regard to foreign countries through the Foreign Office.

Foreign countries, said Mr. Just, undoubtedly derive great and continuous benefit from the issue of these British consular reports at the expense of the British taxpayer, whereas Canada and the British colonies receive no corresponding assistance whatever in making their claims known. Canada depends solely upon her own service of special agents in this and other countries. The suggested service of Imperial commercial agents to reside in Canada would go far to remedy this seeming neglect, and in any case the defect in the present system of collecting and distributing trade information, to the exclusion of the British colonies. It would materially assist colonial efforts at home and abroad in having their growth and their resources, agricultural and industrial, made known systematically through the Imperial channel. He advocates this commercial service in the Colonies in the interests also of the trade of the United Kingdom. "Manufacturers and

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merchants at home will remember that their colonial trade, on the *per capita* basis, is relatively more valuable to them than that with foreign countries. It is a trade, therefore, which political considerations and self-interest would see increased, and which should, therefore, have the solicitude of the Government in providing aids to its development, not inferior to those given to the trade with foreign countries. This the commercial community here has a right to expect. Carefully selected representatives, with a knowledge of the needs and circumstances of the United Kingdom, would be able to select and present information in an acceptable manner, and from the English standpoint. Information supplied from a Canadian point of view, and with a Canadian bias, can never be as acceptable or as authoritative. It is of course not suggested that the proposed service should replace, but rather supplement the present commercial agents of the Canadian Government in the United Kingdom, who, while acting mainly in the interests of Canadian export trade to Great Britain, do not hesitate as far as possible to assist the trade of Great Britain with the Dominion."

THE FRENCH "HOMESTEAD"

M. RUAN, the Minister of Agriculture, has just been authorised at a Council of the French Ministry to introduce a bill for the establishment in France of the "*Bien de Famille*."

The idea of this is founded on the American "Homestead," a system which was studied thoroughly by M. Léveillé, one of the French Deputies.

The "Homestead" or "*Bien de Famille*" is to consist of a dwelling-house and a piece of land the value of which, including furniture for the house and agricultural implements, must not exceed £480. Any Frenchman who wishes to found a "*Bien de Famille*" must make a declaration to that effect, and he must occupy the house himself and cultivate the land, but he may not own two such homesteads. The property is placed under a special law, and the owner of it will then run no risk of having it sold for debt by any future creditors. He may give it away or sell it himself, but he may not mortgage it. It is therefore intended to be a refuge for the whole family in case of misfortune, a home where an unfortunate man may be sure of shelter while tiding over momentary difficulties. It is hoped that by means of this new scheme the number of small landholders will increase in France, and that mechanics and agricultural labourers "will learn to appreciate the two institutions which are the pillars of social order, namely, Landed Property, which is the legitimate fruit of work and economy, and Heritage, which binds together the life of the father with that of his children, and is the most sacred of all human solidarities."

AN EGG-BOILING APPARATUS

A MOST practical invention for travellers is now being sold in Paris. It is a small apparatus of nickel in the form of an egg-cup, in which an egg can be boiled in exactly three minutes. The egg is placed in the cup, on one side of which is a wooden handle and on the other a revolving knife. A lid is placed over the egg, after a measure full of water has been put into the nickel egg-cup. A small tablet of asbestos is then dipped in alcohol, placed under the egg-cup, and set alight. When this is burnt out the egg is cooked. The lid is then removed, the knife turned half round to cut the top off the egg, which is thus cooked in exactly the right time, and can be eaten quite hot.

A NEW SUGAR-PLANT

A GERMAN technical review states that a new plant has been discovered in South America containing an immense proportion of non-fermentable sugar matter.

The plant belongs to the species known in Germany as "*Kunigundenkraut*." It is herbaceous, and grows to a height of about 9 in. From experiments made at the Agricultural Institute, it is found to contain twenty or thirty times as much sugar matter as the beet or the sugar-cane. The chemist Bertoni considers that the discovery of this plant is an important event for the industrial world. Its scientific name is to be *Eupatorium rebandium*.

BARONESS ROTHSCHILD'S NURSING INSTITUTE

THE Baroness James Rothschild has just founded an institution destined to be of great utility in France, namely, a school for the training of sick-nurses. Hitherto the French have depended chiefly on the Sisters of Mercy for their nurses, and now that so many of the religious orders are dispersed, the question of finding good nurses is a serious one.

Baroness Rothschild, in memory of her sister, the late Princess of Wagram, has now established an Institute on so excellent a plan that the women who are trained there will be admirable nurses.

There is a course of medicine and hygiene, and the students will frequent the Broca, Boucicaut, Laënnec and Pasteur Hospitals, the Children's Hospital, and Dr. Garnier's private *clinique*. When they have finished their course they may return to the Institute every three or four years for a month, in order to learn any new methods.

Many of the students will not become professional nurses, but will only go through the training with the idea of being prepared for any emergency in their future home life, or in time of war. The Baroness Rothschild is being assisted in the

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organisation of this huge scheme by Madame Taine, Madame Soulange-Bodin, Mlle. Chaptal, and other well-known Frenchwomen.

THE ENGLISH POTTER AS SEEN BY AN AMERICAN CONSUL

A VERY interesting report on the pottery trade of Staffordshire has been sent home to America by Mr. Smyth, the United States Consul at Burslem. It is a singular fact, he says, in connection with the export of Staffordshire pottery to the United States, that during a period of nearly ten years the trade has shown such slight fluctuations that it might be said to have remained stationary. The growing market in the United States and the increased demand for pottery of all grades during this period seem to have exercised no material or favourable effect on the industry here. The explanation is found in the activity of the German and French makers, who have succeeded in exploiting their products in the American market to the great detriment of Staffordshire ware. This has been accomplished by a close study of the market's needs and by the adaptation of details which relate more particularly to originality of design and neatness of finish rather than to the quality of the ware itself. Even in the home market these features of Continental ware have an attractive interest for the masses; they catch the eye and please the taste to such an extent that English manufacturers of earthenware have to meet competition in their own markets.

While it would be unfair to say that the fault lies wholly with the Staffordshire manufacturer himself, circumscribed and hampered as he is by laws and conditions that are to be found nowhere else, he is, in Mr. Smyth's opinion, in a great measure responsible for the misfortune that has fallen upon the trade. His self-sufficiency and insular prejudice have prevented him from realising the fact that during the last quarter of a century the commercial and industrial world has been very much on the move, and that new methods have been springing into life in constant succession and revolutionising conditions in nearly every department of science and industry. There is no effort made to conceal the fact that the trade of the Potteries is in a most deplorable state; so bad, indeed, that we have to go back thirty years to find its parallel.

If you ask a manufacturer why this is so he will advance a variety of reasons, always assigning first place to the tariff laws of other countries. While the American tariff, says Mr. Smyth, has been a great check on the export of British products, it is just as true that German manufacturers have been placed at a similar disadvantage; nevertheless, the expansion of German trade with the United States has been steady for the last twenty years. In the pottery trade this has been particularly noticeable. The German potter has succeeded where the English potter has failed, for several reasons, chief among which are (1) his superior training based on a more thorough system of education, both technical and scientific; (2) his concentration and industrious application; (3) his frugality, steadiness, and sobriety. Furthermore, the relations between the employer and employee are more elastic and consequently much more conducive to a free interchange of thought and the maintenance of mutual understanding and goodwill. Now, the position of the English potter, says Mr. Smyth, is exactly the reverse. He has only recently discovered that his system of education is all wrong; that his operatives have neither concentration nor application, as compared with their German competitors, and that they fall far behind them in those habits and virtues that are so essential to success in the lives of industrial communities.

THE NEGLECT OF OUR CANALS

MR. SMYTH sees that the lack of cheap transportation by rail and internal waterways is a great drawback to the trade. In this respect the Continental manufacturers have a decided advantage. The spirit of enterprise which is rapidly developing the canal system of Germany finds no field here. The result is that an important item in the economy of production is lost to the English potter. In the early days he found his raw material close at home, but as the quality of his ware improved he had to travel further afield, until now he is compelled to go down to the south-west of England for his supply of stone and clay. The German draws from the same source, and, paradoxical as it may seem, it costs him less to lay down his raw material on the Continent than it costs the Staffordshire potter on his own pot bank at home. The average rate per ton from Cornwall by sea to Runcorn, on the Mersey, near Liverpool, and thence by the North Stafford Canal to the Potteries, is about 12*s*., while the rate from Cornwall to ports in Germany is about 6*s*. Mr. Smyth characterises the English railway system as a gigantic trust, in respect of the way in which the Companies combine to maintain certain rates for the transportation of freight. "For years Chambers of Commerce and commercial bodies throughout the land, representing all trades and industries, have thundered against its oppression by speeches, resolutions, and appeals to Parliament, but the result has always been the same; the position of the railway companies remains undisturbed, and that position means nothing more or less than a relentless and absolute dictatorship. There is no form of commercial or industrial combination in the United States to compare with it."

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THE COST OF REORGANISING OUR CANAL SYSTEM

MR. BENJAMIN HOWARTH THWAITE, Assoc. M. Inst. C.E., who recently read a paper on "The Transport Possibilities of our Inland Navigable Waterways" at the Royal United Service Institution, estimates as follows the cost of nationalising, perfecting, and electrifying our canal system. Assuming that 3500 miles of the canal system of Great Britain were purchasable at two-thirds of their original cost of construction, say £2350 per mile of length, then the capital required would be £8,225,000. Allowing £500 per mile for the cost of standardising the locks, and £2000 per mile for the electrification of the canals, then the total amount required would be £16,975,000. Allowing the balance to make up twenty millions to be set aside for working capital, it should secure for the State a splendid transport property. Seeing that over sixty millions sterling have been expended in tramway systems in this country, and that over 300 millions sterling have been absorbed in municipal work, the Government could surely be permitted by the country to become, like France and Germany, the owners of an efficient, electrified, navigable, inland water service. The proposed electrification of our canal system would, moreover, provide a cheap supply of electric power for external service, as well as for pumping, irrigation, ploughing, churning, milling, and vegetable and flower growth. The revivification of our inland navigable waterway system would go far towards securing a revival of our agricultural prosperity.

THE POSSIBILITIES OF CONCRETE AND STEEL

THAT we are in danger of failing to appreciate to the full extent the possibilities of concrete used in conjunction with a skeleton or core of iron or steel, is the burden of a letter from Mr. Gilbert R. Redgrave, Assoc. Inst. C.E., which appeared in a recent number of the very ably conducted Engineering Supplement which the *Times* has now begun to issue every Wednesday. Mr. Redgrave points out that in this country we were almost the first to employ concrete largely for engineering and structural purposes; our Portland cement was sent all over the world, and attained a widespread reputation. But in the more recent applications of cement, especially when used in combination with suitably-inserted metal sheets or rods, we are certainly very backward, as compared with the Continent and the United States. Iron and concrete, used together in this way, become virtually a new building material, with vastly increased strength and capable of being employed for numerous purposes in the arts of construction for which concrete alone would be out of the question.

The use of a relatively very small bar of notched or twisted steel or of a sheet of "extended metal," embedded in a mass of concrete, adds so greatly to its strength, and these materials, when combined under the best conditions, acquire such new properties, that a wide field of usefulness seems open to concrete in the future. During a recent visit to the Continent, and later to the St. Louis Exhibition, Mr. Redgrave has been much impressed with the rapid progress made abroad and in America with concrete construction. Several French and German inventors lay claim to various methods of using the steel bars to form the skeleton, but as long as the metal is deeply embedded in the material and presents a sufficiently large surface to afford to the concrete a fair degree of adhesive grip, it seems to matter but little how it is employed, and surprising results have been obtained from relatively small proportions of metal. In the United States the use of reinforced concrete is greatly on the increase, and cement works are being erected in every part of the country. It is even predicted that, when the forests are exhausted, timber will be replaced by cement, and that the American buildings in the future will become both durable and fireproof owing to this cause.

HOW SHARKS ARE CAUGHT

THE dangers and delights attending the labours of the Australian shark-fisher are alluringly told by a writer in a Sydney newspaper; and it does not in the least destroy the reader's illusion of the monsters to have the writer's apology that they are not twenty or even eighteen, but mere minnows of fourteen feet in length.

The lean sands invite to the struggle which concentrates about these flickering lights below, the struggle between man and his enemy in the deep. And, at the first lamp, a candle stuck in a broken bottle, the method of attack discovers itself. A hook 8 in. long, of tough quarter-inch steel, attaches to 4 ft. of wire rope, carrying a grapple which holds strenuously to the sandy bottom, foiling the ceaseless efforts of the sea at disgorgement of a trap for this great one among its creatures. To the loop of this wire comes the line, three-stranded, thick almost as a window cord. And by the light of the primitive lamp, the fisher secures Jack Shark's fatal meal, a salmon-head, tying it to the big hook in deft hurry.

These so-called salmon come into the shoal water of our beaches in huge schools, driven at times right ashore by the insatiate shark. One has passed men along the beach who threw lines out into the dark, hauling them in again with vigorous, jerky, hand-over-hand action. These men are "jagging" for the almost inedible fish, with lines upon which hooks are set at intervals. No bait is used, the salmon filling the water to.

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such an extent that dragging the bare hooks through the shoal a fish is hit. The story then ends badly for the fish, who forthwith adorns a larger hook that one of his enemies shall kill the other.

The head forms the best bait; it sticks on the hook better than the softer parts. And then the fisherman, with immense effort, swings the bait 25 yards or so into the dim white surf. One of them, having beyond his fellows the trick of it, is said to throw at times as far as 40 yards. It seems simple enough, but after a trial fifteen will perhaps be deemed quite a respectable throw. The trap is set, however. Now comes the waiting; the crowd of watchers curiously subdued, as though their noise might scare the cruising devil out there in the darkness from the death which awaits him.

Further up the beach, the next group becomes suddenly compact; there is movement strongly suggested through a hundred yards of sonorous gloom. A sharp hail comes down the light wind: "Shark, Ho-o-oh." Again it comes, and one finds oneself running over dry, squeaking sand; part of a universal scurry felt all about one in the dark. From amid the concentrated blackness of close-packed humanity on the water's edge loud splashings; further up the sand two men hold steady the line which has brought 10 ft. of hunger and cruelty ashore. The shark, lying with the last word of the surf murmuring about him, has yet to be killed. He looks like a stranded Whitehead torpedo, save that there are sweepings of his great tail, which run into foot-tons of muscular energy. And now a man with an iron bar wades beside him in the ebb and flow of the spent waves, and to an obligato of thickly drumming blows, heard above the voice of his mother, the sea, his mighty struggles faint slowly into mere nerve quiverings. Then it is that a rope is fastened round his tail, and, strongly hauled by a dozen willing volunteers, he leaves the water for ever; to lie, while hot suns dry the flesh off his bones, and salt winds scatter it abroad in malodorous dust, an offence to mankind, and a greater nuisance dead than danger alive.

HOW FOREIGNERS SUPERSEDE BRITISH SEAMEN

IN his report upon the shipping and navigation of Antwerp for the year 1904, Mr. Consul-General Hertslet refers again to the system of discharging at foreign ports the crews serving on board British vessels, which, he says, produces a yearly increase in the number of foreign seamen and a decrease in the number of British seamen employed in the British mercantile marine. The following is an example of what frequently occurs. A vessel arrives at Antwerp with a crew composed almost wholly of British seamen engaged at some port in the United Kingdom, and is about to make Antwerp the final port for the discharge of cargo. The seamen, under the Continental clause in the ship's agreement, are discharged in the usual course as soon as the ship arrives. The men when discharged naturally wish to return to their homes and to take advantage of Section 186 of the Merchant Shipping Act, 1894, which entitles them to have their passages home paid by the ship. When the vessel is ready for sea and the master is about to engage a fresh crew, he has either to ship a crew composed almost entirely of foreigners at Antwerp, or to go to the expense of paying the passages of a British crew from the United Kingdom to this port, the former course being invariably adopted in order to save expense. It is, therefore, easily seen how foreigners supersede British seamen on board British ships, as, if in the example quoted the vessel should next discharge her crew in the United Kingdom, the discharged seamen will either be reshipped or will await their chance of procuring employment on board a ship engaging a crew in the United Kingdom. On the other hand, should the vessel again make Antwerp the final port for the discharge of cargo, the men will return to their homes there and await the departure of the ship, in which they will in all probability be re-engaged.

Mr. Hertslet has again to report a flourishing year at the port of Antwerp, in spite of the generally prevailing depression of the shipping industry. The total returns of shipping entering the port in 1904 amounted to 5852 vessels with a tonnage of 9,400,335 tons, thus showing an increase over the figures for the year 1903 of 91 vessels and 268,504 tons. This increase is again more than accounted for by the augmentation in British shipping, of which the figures for the year were 3107 vessels with a tonnage of 4,621,214 tons, thus showing a gain of 109 vessels and 260,105 tons over the year 1903.

PREHISTORIC SKELETONS IN A FRENCH MUSEUM

THANKS to the generosity of M. Edmond de Rothschild, the Natural History Museum of Paris now has a collection of skeletons of prehistoric wild beasts unique in the world. The Professor of Palæontology of this Museum had long wished to have such specimens, and the immense glass case which was officially inaugurated the other day by the Minister of Public Instruction, contains remarkably fine skeletons of the four chief tribes of wild animals. There are skeletons in various attitudes of three bears, three lions, a hyena and a cave-wolf.

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THE ARTILLERY OF BUSINESS

QUICKLY, almost without warning, there has grown up in our midst in the space of a few short years the gigantic fabric of modern advertising, permeating every branch of our national business life, making or breaking those who seek its aid in proportion to the attention that they give it; rewarding those who use it judiciously and well more than handsomely, driving those who abuse its powers to a state which is worse than that they originally occupied.

In a word, advertising is a living force.

But the modern business man, engrossed in the daily routine the conduct of his enterprise requires, is unfortunately often not cognisant of the progress that has actually been made in advertising as a science, or of the expert knowledge required to successfully handle modern advertising.

It was in the hope of obtaining some information on this subject that the writer asked Mr. John Spottiswoode, one of the most progressive and aggressive of the new school of advertising agents, for an interview; a request which was readily granted. Accordingly, he called at Clun House, the present headquarters of Mr. Spottiswoode's organisation, and was shown the vast routine, expert and creative work the handling of a modern advertising account entails.

A question as to advertising agents in general brought from Mr. Spottiswoode a characteristic reply, showing not only his own position on the advertising agency question, but also the standpoint of the modern or expert agency.

"Sixty per cent.," said Mr. Spottiswoode "of advertising campaigns planned in the past have been failures. And I believe one of the most prolific causes of failure has been that would-be advertisers have refused to recognise that there are two kinds of advertising agents. First, there is the agent who is nothing more or less than a space broker, and who will return to his client the greater part of the commission he receives from the newspapers, who does nothing more than buy space, check, pass, and pay accounts. But while the vast majority of advertising agents are of this type, there is another class rapidly, and I may add necessarily, coming to the front. I mean the agent who gives honest service to his client, who thinks out his client's advertising difficulties, forms selling plans, maps out advertising campaigns in their every detail, writes and illustrates the right kind of convincing copy to sell the goods, and generally attends to every detail of his client's advertising. This type of agent cannot afford to work for less than the full ten per cent. he receives from the newspaper; for while he has to support all the organisation of the mere space broker, he has in addition to bear the expense of an expert copy-writing and artistic staff, as well as pay the salaries of men who are fully competent to deal with every phase of modern advertising.

"There are also other fruitful causes of non-success, wrong copy, wrong media, wrong goods, but in almost every instance they can be traced back to the one fatal error of doing business with the man who seemed cheapest in the beginning, rather than of considering what would happen in the long run. 'Looking ahead' is the solution of the agency problem from the advertiser's point of view, and 'looking ahead' means taking advantage of that expert service without which advertising success is hard."

It was not necessary to ask which type of agency Mr. Spottiswoode himself had organised, or his notepaper and advertising matter bear the words "Spottiswoode Service," a phrase already associated in the minds of many advertisers with all that is best and most progressive in the world of advertising.

"You ask me how a modern advertising account is handled," continued Mr. Spottis-

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woode. "Well, I cannot speak for others, as I am not acquainted with the methods other English agents use, my own knowledge of advertising having been for the most part gained in the United States, but I will give you an outline of how we handle an account in these offices. Say an advertiser or business man who wishes to know about advertising in relation to his particular business writes us on the matter; an educated gentleman, *not* a canvasser, fully conversant with the possibilities, and possessing practical knowledge of advertising, calls and sees him. He discusses fully with the advertiser, actual or potential, the possibilities of the article to be advertised. A selling plan is then, if necessary, drawn up, and should the product possess no special selling features, suggestions are made by our staff for introducing them. After that, the complete campaign is outlined in all its details, and to the non-advertising man the extent of this detail work is a matter of astonishment. Retailers may have to be stocked with the goods, booklets written, packets and other printed matter got out, posters and show-cards designed and printed, names and trade-marks invented and registered, follow up systems and stationery prepared, and in some cases legal or other professional advice sought for the solving of trade difficulties.

"In addition there are copy and designs to be got out, the amount of the appropriation and the way in which it is to be spent settled, media to be chosen, blocks and stereos made, and routine work to be gone through. Planning advertising is a sufficiently complicated affair at any time, and when business men deliberately set out and attempt to do, in spare minutes between other jobs, work that should have the attention not of one man, but of a capable staff, it is not to be wondered at that one hears so much about advertising failures from men who have tried it. The abuse of advertising is more prevalent than its use."

"You said, Mr. Spottiswoode, that one cause of failure was poor copy. What do you mean by that?"

"That the matter the advertisement contained was not of a kind to sell the goods advertised. I am not a believer, and it is surely a matter of ordinary common sense, in that style of so-called advertising which consists of the name of the article in bold type. This is used largely by the Whiskey people, but they are not by any means the only offenders."

"Your point of view is, then, that this kind of advertising is throwing away money?"

"Nothing more or less. There is, of course, a certain amount of general publicity attached to an announcement of this character, but *facts* and *convincing arguments* are what sell goods. The good salesman is not a parrot, repeating incessantly the name of the article to be sold, but an intelligent thinking being, persuading his customers to purchase by the soundness of his logic and argument, and an able representation of the merits of his goods. The same arguments apply to advertising. The mission of an advertisement is just the same as that of a salesman, both are judged by results, in other words by the amount of goods they sell. Logical sane copy will produce results that the user of 'smart' copy or name and address announcements (it may be name only) never even dreams of. But it must be both reasonable and convincing; it must contain both fact and selling force."

"Do you believe in art in advertising?"

"Certainly, but the pictures must be good and specially produced for the purpose. And while there are any number of artists who can draw, it is a matter of surprise to me how few can grasp what is wanted in an advertising design. We have, as you know, however, our own studio for this purpose, where we find employment for a staff of more than twenty artists. At the same time, it must be borne in mind that the *copy* and not the picture, where used, is the most important part of an advertisement. The picture simply acts as an eye catcher, the printed matter sells the goods."

This was in itself, for the proprietor of an Agency so well known for its artistic work, a sufficiently candid statement, but that it is the policy adhered to by the Spottiswoode Advertising Agency is proved by a glance through the advertising they have put out for their numerous clients. In almost every

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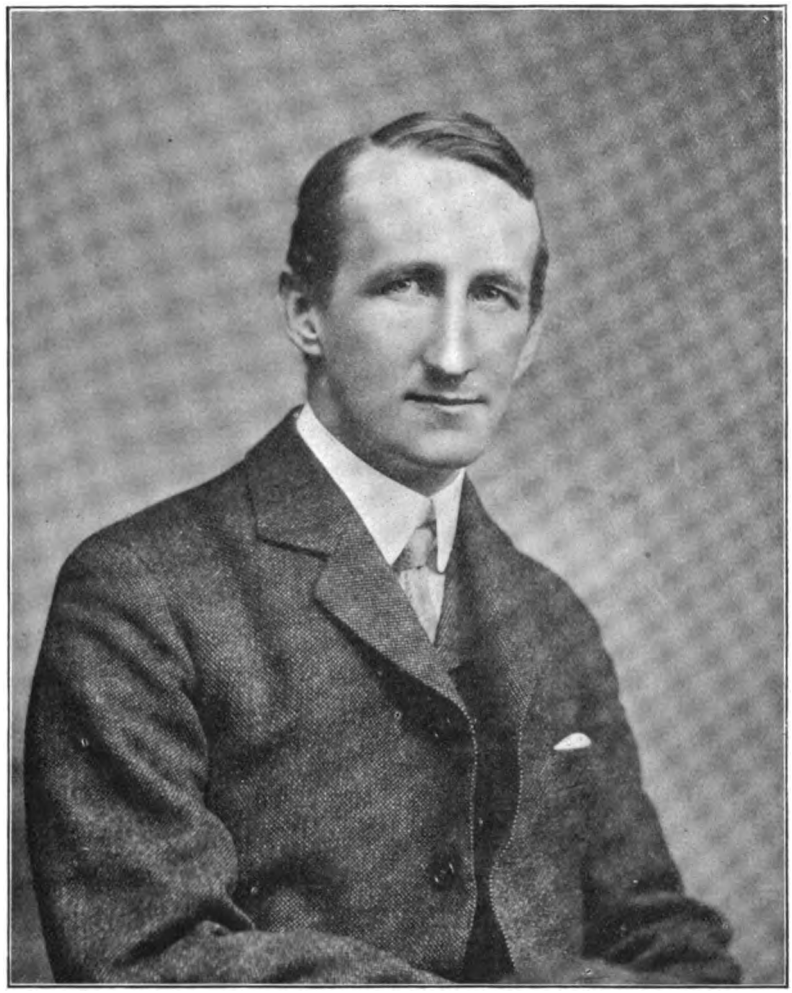
instance a combination of fine art work and convincingly written type matter. Looking through the work one could not but be struck by the number of names new to the advertising field. This prompted an obvious question.

"We are a young Agency," answered Mr. Spottiswoode, "but we have already succeeded, in the short time we have been established, in making the advertising of some quite new concerns whose accounts we have been handling, show a handsome profit. We set out to create new business for ourselves, and have succeeded in doing so. At the same time, many old advertisers who know the business thoroughly are placing their appropriations in our hands, a compliment not often paid to a new Agency, which has not been in existence a year."

"Is there any particular branch of advertising which your Agency specialises? Your name has, I know, been associated with the advertising of branded goods?"

"Well, it is hardly fair to put us down as experts on branded goods alone, for while we are general advertising agents, our service is one that appeals especially to manufacturers; and in many cases, though not by any means in all, branded goods are the best solution of a manufacturer's advertising problem. We may be experts on the advertising of branded goods,



MR. JOHN SPOTTISWOODE

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but this is due solely to the fact that we are experts on advertising for manufacturers. It is not by any means the only way to advertising success. Indeed, there are so many methods of advertising that might be used, that the business man who attempts to handle his own does not know which to use. Even in those cases where a firm has an elaborate advertising department of its own, the advice of a good agency is invaluable. Again, no single firm can afford to maintain the resources for copy, photographic and art work, which a good Agency has at its command."

"What would be your advice to a manufacturer who wished to advertise?"

"To consult a good agent, who will render honest straightforward service and, if there is no possibility of success, prevent him from and not assist him in spending money. I am not the only advertising agent in London by any means, but I can promise any one who consults this Agency on the question of advertising that every point in their case will be carefully considered, and a frank statement of the possibilities or otherwise of their goods made out, and should it be desirable to go further into the matter, careful and intelligent service given. When I decided to give up printing and enter the larger sphere of advertising, I chose my staff with the greatest care, and I believe it to be the best staff I could have for my purpose, namely, the harmonious planning and successful carrying out of every detail of a client's advertising. Advertising is a profession, and we make a profession of it. That, I think, is a fair statement of the case."

The writer cannot, perhaps, do better than end this interview with Mr. Spottiswoode by quoting an advertisement he recently issued; and although it was originally inserted in another paper, the offer made loses none of its potency through coming second-hand to the reader. It is worth while reading it carefully, it may be worth while replying to it. It is so most certainly if the reader is an advertiser present or prospective:

We offer the services of an advertising department which no one advertiser could afford to retain.

The force behind the service is comprised as follows:

The brains of *trained* advertising experts, who will carefully and thoroughly investigate your advertising as it at present stands; who will discover (if they exist) the real advertising possibilities, or create new selling features.

The knowledge of *trained* advertisement copy writers, who know from experience the class of copy that *sells goods.*

The skill of over twenty artists chosen from the best available talent on both sides of the Atlantic, who will make your announcements eye-compelling and attractive.

The experience of keen buyers of advertising space, well versed in the pulling powers of different media, and conversant with the knotty question of circulation.

This force stands behind the advertising every client of this Agency, whether he spends £1000 or £100,000.

We offer this force, and the organisation that controls it, as an *advertising department.*

Moreover, we offer to demonstrate our service free of charge.

If an advertiser will ask us for credentials, we will produce them in the form of a complete campaign, written and illustrated specially for that advertiser, dealing with the problems peculiar to his business. All we ask is the time necessary to prepare such a campaign.

Surely it is to your advantage to afford us the opportunity we seek? Write the Spottiswoode Advertising Agency, Clun House, Surrey Street, Strand, London, W.C.

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THE BENEFIT OF SANCTUARY

A CHAPTER OF CONTRASTS

FEW people, as they walk along Victoria Street towards the Abbey, recall, even if they know, the fascinating history which attaches to the heart of Westminster. Where the Westminster Palace Hotel now stands was formerly the Almonry, where the alms of the Abbey were distributed to the poor. It was here that the Prior of Westminster gave Caxton leave to set up his printing-press, whereby a gift greater than any alms was made to the English race.

At the Abbey end of Victoria Street there stood until the middle of the eighteenth century a gloomy gate-house prison. It was here that Sir Walter Raleigh passed the night before his execution: here Colonel Lovelace wrote the well-known lines:

> "Stone walls do not a prison make,
> Nor iron bars a cage."

Hampden and the astrologer Lilly were imprisoned here, and Titus Oates died within its walls, while Edmund Burke lived in an adjoining house.

Pass in imagination through this ancient gate-house and you find yourself in the Sanctuary of Westminster. St. Peter's Sanctuary was a little building of massive stonework, with a single door of solid oak covered with iron plates. To it any hunted criminal had the right of entry, and, though his pursuers might besiege him without danger of sacrilege, they could not force an entry and take him out. It is easy to believe that the criminals of London—especially, perhaps, the inhabitants of "Thieving Lane," which ran close by the open space where the statues of Peel and Beaconsfield stand now—found frequent refuge in the Sanctuary.

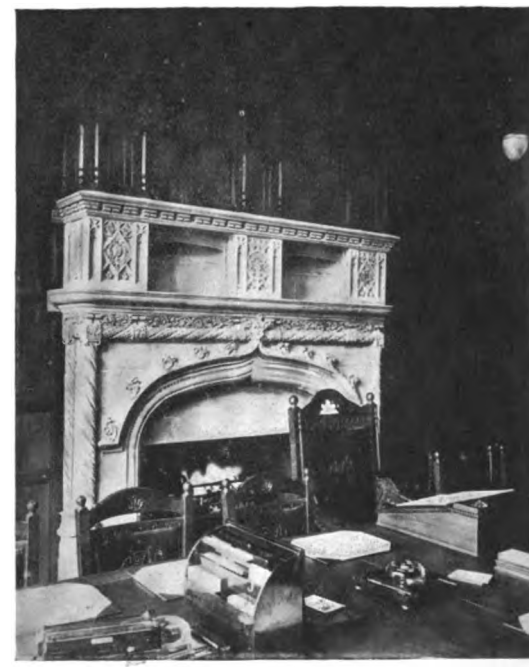
By a curious contrast, the Middlesex Sessions House, where the sentences of justice are now pronounced, stands on the very site where criminals of former days took refuge from the penalties of crime.

The Benefit of Sanctuary

Other days bring other ways, and though such refuge for criminals no longer exists, the punishments inflicted by law are infinitely milder and less cruel than they were in former times.

It is no mere play upon words to say that there exists beneath the western towers of the Abbey a benefit of sanctuary unknown to ancient times and far more helpful than any refuge for criminals. Modern life assurance affords a veritable sanctuary, not from the penalties of crime, but from the financial consequences of death; and here in the Sanctuary is the building of the Clergy Mutual Assurance Society, which provides for the clergy and their relations a sure and certain refuge from the poverty and hardship which only too frequently result from death.

It is hardly probable that any criminal who had the opportunity of obtaining refuge in the old Sanctuary neglected to avail himself of the chance. One could wish the same might be said of the wiser sanctuary of life assurance which is available to-day. One does not like to think that the criminal of old was careful



IN THE BOARD ROOM

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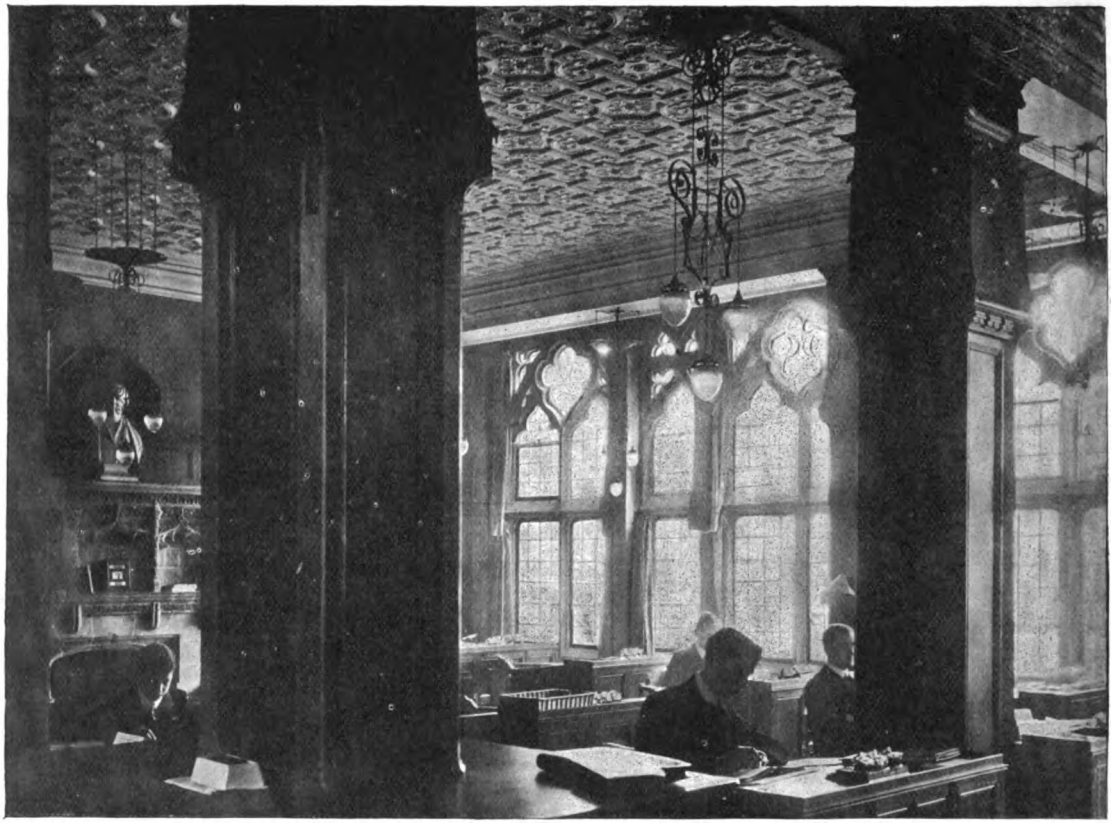

GENERAL OFFICE OF THE CLERGY MUTUAL ASSURANCE SOCIETY

to save his own skin, and that the clergy of to-day abstain from the benefit of sanctuary—from the advantages of life assurance in the Clergy Mutual—because it is the happiness of their wives and children that is concerned, rather than the personal well-being of the clergy themselves. Perhaps the neglect of opportunities must rather be put down to the fact that the danger to the criminal was imminent, while the average man thinks that the financial penalties of death, which will fall upon his dependants, are remote; and yet daily experience should convince him that those penalties may fall due for payment at any moment.

Sound from the First

The Society began business in 1829, and the original prospectus is a most interesting document. It is a foolscap sheet of only four pages. It reveals the fact that at the commencement, as has been the case ever since, the patrons were the Archbishops of Canterbury and York, and the president was the Bishop of London, while among the vice-presidents were twenty-one bishops.

The original prospectus announces that "applications for assurances are now receiving by the secretaries at the office, No. 27 Parliament Street, Westminster, where attendance will be given . . . on every Wednesday, Thursday, and Friday between the hours of 1 and 4."

The Society began in a small way, but from the commencement it received the highest support and worked under the most reliable guidance. The original prospectus says that the tables were certified by Messrs. Morgan, Gompertz, Ansell, and Finlaison, two of whom were Fellows of the Royal Society, and all of whose names have lived to the present day as mathematicians and actuaries whose work has been of the most fundamental value in the science of life assurance.

The Longevity of the Clergy

The idea of an assurance society especially for the clergy was due to the Rev. John Hodgson, vicar of St. Peter's, Isle of Thanet, who was the founder and first secretary of the Clergy Mutual. He investigated the mortality among the clergy and concluded that it was more

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favourable than the mortality of the general population. He lived to see his ideas abundantly confirmed, both by the statistics of the Society which he founded and by the independent observations of other men.

The mortality experience of the Clergy Mutual from 1829 to 1887 has been published, and constitutes a most valuable contribution to vital statistics. The report shows in the clearest possible way that the mortality experience of the Society has not only been much more favourable than that of assured lives in general, but more favourable also than the mortality deduced by Mr. Hodgson from the observations of mortality among clergy which he made over a period of 110 years. The sanity of Mr. Hodgson's judgment is shown by the fact that the experience of the Society which he founded has been far better even than he expected, and the reasons which led him to form a society especially for the clergy have proved even stronger than he thought.

A concrete illustration of the longevity of the clergy is to be found in the fact that the Society during the three-quarters of a century through which it has existed has only had four chairmen. The first was Archdeacon Hale of London (1830 to 1870); the second was Archdeacon Jennings of Westminster (1870 to 1883), who died at the age of eighty-five; and the third the late Dean Bradley of Westminster, who died in 1901, and was succeeded by the Very Rev. Dr. Wace, Dean of Canterbury, the present Chairman of the Society.

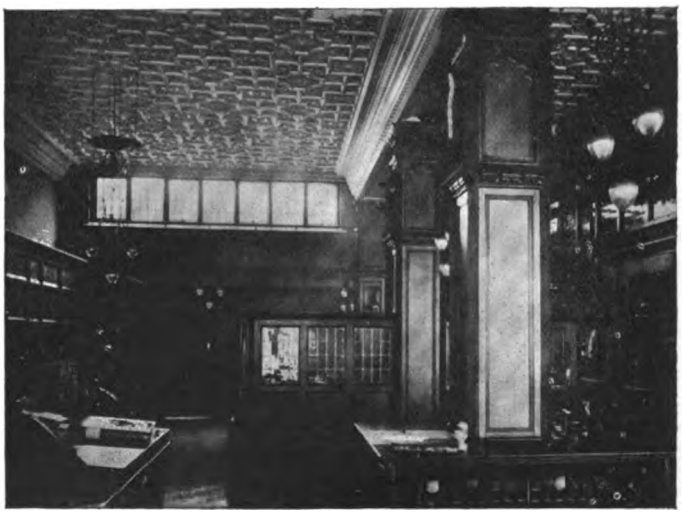
The notion of forming an assurance society for the clergy was a very shrewd and practical one. It is obvious that the cost of life assurance is least where the longevity of the assured lives is greatest, and a man who is entitled to assure in the most healthy class is clearly foolish if he only takes his place as one of the rank and file of a relatively unhealthy section. His superior longevity reduces the cost of assurance for others, while their inferior longevity increases the cost of assurance for him.

The Old World and the New

The story of the Clergy Mutual is a chapter of contrasts. It is only necessary to enter the building which the Society now possesses to realise the truth of this remark. When the Society moved to the Sanctuary, fifty years ago, it was only as an ordinary tenant of the offices which it occupied. A lease for eighty years having, however, been recently obtained from the Ecclesiastical Commissioners, the Society felt itself justified in reconstructing its offices in a manner worthy of its position in the assurance world. The architect was Mr. W. D. Caröe, M.A., F.S.A., F.R.I.B.A. The interior of the building is somewhat ecclesiastical in character, as might perhaps be expected from the architect of many churches, and the natural inclinations of the majority of the Board. Fine workmanship in handsome oak and cathedral glass, accompanied by excellent taste in decoration, is in evidence throughout.

Stand in the front of this attractive building and you see the stream of London traffic and of London life passing by in one unending procession; go to the back of the building and you see the undisturbed quietness and repose of Dean's Yard. Only a gateway separates the stir and bustle of the life of a great city from the restful charm of what might be a cathedral close of one of the sleepiest of provincial towns.

Here we find Westminster School, and Ashburnham House, now the property of the School, which contains specimens of the work of every century from the eleventh to the eighteenth. Ashburnham House is for the most part the work of Inigo Jones, and is regarded as a leading example of the power of a master to produce in a moderate space and with ordinary materials a perfectly satisfactory effect.



GENERAL OFFICE: ANOTHER VIEW

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Sanctuary and Broadway

Not far away from the Sanctuary is Broadway, Westminster, where—perhaps in Blackhorse Yard—Dick Turpin used to live. But one calls to mind another Broadway, across the Atlantic, in the city of New York, which is the home of the giant insurance companies of America; and, since the present subject is so suggestive of contrasts—contrasts between old and new, between ceaseless activity and unbroken repose, between sanctuary for criminals and the modern Sessions House—one is tempted to contrast the business abilities of the clergy of the Church of England with those of the financial magnates of the city of New York.

The first essential in life assurance is security; and the Clergy Mutual has funds of more than £4,000,000, an amount sufficient to meet all their liabilities if the rate of interest is only 2½ per cent. per annum. It was the first mutual society to adopt a position of such great financial strength as these reserves imply, and it must be remembered that a life office yields the largest profits when its financial position is the strongest. Since the Clergy Mutual earns interest at the rate of about £3 15*s*. per cent. of its funds and assumes that only 2½ per cent. is necessary, it follows that a profit is earned for the policy-holders at the rate of £1 5*s*. per cent. per annum of the funds. The American companies on the average earn profits from this source of about 8*s*. per cent. per annum of the funds; so that the profit in the Clergy Mutual due to this cause is proportionately about three times as great as that of the American companies.

The second principal source of surplus in a life office is the difference between the expenditure provided for and the expenditure incurred. The Clergy Mutual spends about 7 per cent. of its premium income on the management of the business, while the American companies on the average spend 26 per cent. The Americans derive no profit from the possession of reserves for expenses in excess of the actual expenditure, while the Clergy Mutual has about 5½ per cent. of the premium income as a contribution to bonuses.

The third principal source of surplus is favourable mortality, and the mortality in the Clergy Mutual is only about two-thirds of what might be expected according to the Healthy Males Table of the Institute of Actuaries.

These facts suffice to explain the superior benefits of the policies issued by the Clergy Mutual, and show that, judged by the most reliable and most important standards, the life office, directed mainly by the clergy of the Church of England, since they always constitute largely the Board, is altogether superior to the world-wide companies controlled by the financial magnates of New York.

The Directors, of whom at the present time the Very Rev. Dr. Wace, Dean of Canterbury, is Chairman and Sir Paget Bowman, Bart., Deputy-Chairman, have contrived to place the Clergy Mutual in the first rank among British life offices, and to provide for their policy-holders benefits which, for security and for profit, are unsurpassed by any life office in the world.

But comparing New York with Westminster the advantage is not wholly with the latter. One could wish that the Clergy Mutual could emulate in some degree the extent of business transacted by the American companies. The Society has always worked without employing agents or paying commission for the introduction of business, and this is a great source of economy and directly benefits the existing policy-holders; but one would gladly see the sphere of the Society's operations more widely extended. Membership has hitherto been limited to the clergy and their relatives, and it is to be regretted that these classes have not shown so fully as might have been expected their appreciation of the benefits within their reach. It is to be feared that they have been too ready to listen to the personal solicitations of the agents of commercial companies rather than take advantage of the benefits which are offered by the purely mutual society founded for their particular benefit.

Perhaps the time has come when the Society might well extend the sphere of its operations, though it must certainly be admitted that it has in recent years been making its advantages known with far greater vigour and success than formerly. For a long time the kinds of assurance effected by the Society were limited in their range; but there is now no desirable feature of life assurance which the Society does not provide upon favourable terms.

From Roman times to now, almost every great Englishman has found his way to Westminster; the famous Abbey itself is the resting-place of the greatest of the great among Englishmen, and it is appropriate that here, on the site of the old Sanctuary, and beneath the towers of the Abbey, there should be an institution accomplishing on modern scientific lines, in ways unsurpassed by any similar association in the world, a work of the greatest beneficence and importance.

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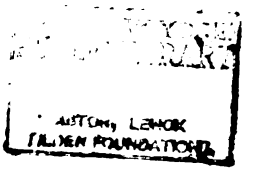

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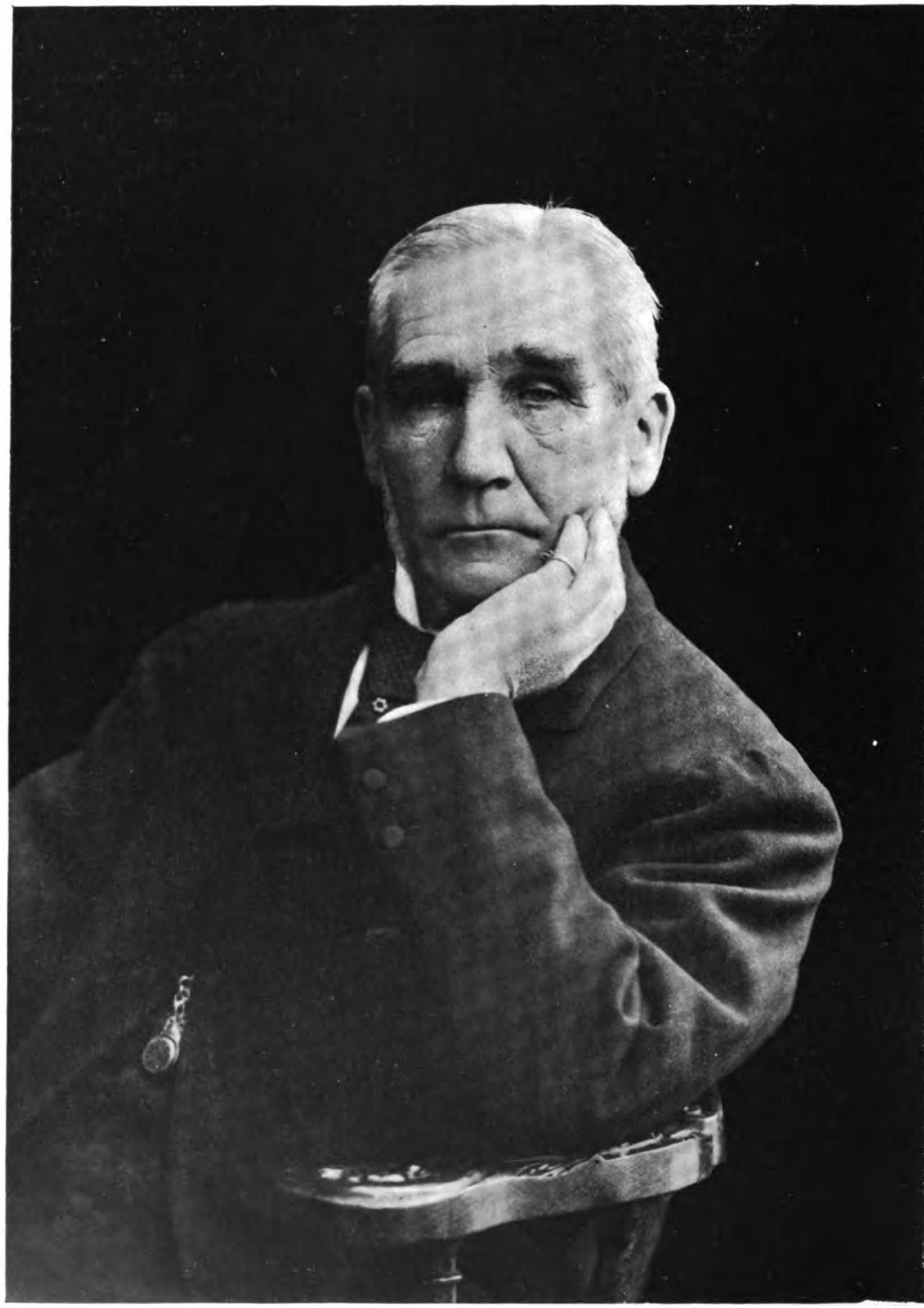

Whitlock.

THE RIGHT HON. SIR HENRY HARTLEY FOWLER, G.C.S.I., M.P.

WHOSE TWENTY-FIFTH YEAR OF REPRESENTATION OF WOLVERHAMPTON EAST HAS JUST BEEN CELEBRATED BY HIS FELLOW TOWNSMEN

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The World's Work And Play

EDITED BY HENRY NORMAN, M.P.

VOL. V LONDON, MAY 1905 No. 30

ASTOR LENOX TILDEN FOUNDATIONS

IN LORD KELVIN'S WORKSHOP

A MANY-SIDED GENIUS—LORD KELVIN'S MODESTY—A MIND THAT RANGES FROM TEASPOONS TO CABLES—THE COMMERCIAL FACTORY AT GLASGOW WHERE CITIZENS BUY SPECTACLES AND NATIONS EQUIP NAVIES

BY

R. J. MACLENNAN

THE manifold nature of Lord Kelvin's life-work has been an inspiring theme to many pens; it has also been a bewildering one. The phases are so varied. In Lord Kelvin we have the genius who by his enunciation of the law of retardation in submarine cables overcame the difficulties that threatened to thwart the great scheme of the late Mr. Cyrus Field, making for the uniting of Europe and America by a telegraph line across the Atlantic. He designed the cable which would ensure a reasonable speed for messages, and invented a new instrument to receive them. On the other hand, we have in his Lordship the inventor of a water-tap for use in ordinary kitchen sinks, and an ex-professor with improvements to suggest on the shape of teaspoons.

That is only one aspect of the complexity of his nature. Let us take another. A *Times* contributor, writing in 1896 on the occasion of Lord Kelvin's jubilee as a professor in Glasgow University, said:

"It would be impossible to write the history of electrical discovery and invention in the last fifty years without reference to that immense share Lord Kelvin has had in it. His contributions have not only been on the purely scientific side without equal, but what is also remarkable he has shown unusual power in bringing to bear abstract principles in the construction and invention of instruments having a most practical value. Broadly speaking, his practical electrical inventions fall into three great groups. First, those connected with telegraphy and submarine cables; secondly, those connected with navigation and the mariner's compass; and last, those connected with instruments of precision for electrical measurements. This by no means exhausts the series, but it is sufficiently distinctive. He has in all aspects of his work a definiteness of purpose which brings him at once to the boundary from which he takes a fresh departure into the unknown and from which he has rarely returned without the spoils of victory in the form of some new practical invention or suggestive theory."

What is Lord Kelvin's own view? In a speech delivered in the city of his adoption in the same year in which the foregoing was written, he said: "One word characterises the most strenuous efforts for the advancement of science that I have made perseveringly during fifty-five years—that word is failure. I know no more of electric and magnetic force or of the relation between ether, electricity, and ponderable matter, or of chemical affinity than I knew and tried to teach my students of natural philosophy in my first session as a professor."

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Turning for a moment to picture him as an expounder of those secrets Nature is so loth to disclose, the diverse characteristics of the man are further in evidence. We have instanced his versatility and his modesty; we are now to

A GLIMPSE OF THE STANDARDISING LABORATORY

meet his eccentricities—the mildest of those of genius—and his humour. It is a living memory with his old students, that rostrum of his, with its wealth of material for simple but expressive experiment. A table littered with packets of sugar, salt, bottles of water, oil, whisky, and syrup, wool skeins of every hue, shoemaker's wax, sealing wax, piano wire, billiard balls, spinning tops, organ pipes, Jew's harps, mouth harmoniums, and toy balloons. But the suggestion of the Kindergarten did not linger when the lecturer, warming to his subject, soared (above the heads of his hearers more often than not) out of the appealing commonplace into the realms where such words as "parallelopipidal partitionings," "enantimorphis," "tetrakaidekahedronal cells" were in occasional currency. It was then the buoyant undergraduate was moved to rapturous applause, and the professor gravely wrote "Aphasia" [speechlessness] on the blackboard as an indication of a virulent disease common to students in the natural philosophy class. Three pet aversions urged his denunciations—Hegel, the British system of weights and measures, which he described as insular and barbarous, and the Cambridge system of examination. If a fourth were to be added, it would probably be the multiplication table. Strange as it may seem, Lord Kelvin has been known to make six times seven = *fifty-four*. It has been remarked he is more at home in the differential calculus—and after all, did not Milton spell "dog" with two g's?

Some of Lord Kelvin's experiments rank as classics. That determining the velocity of a bullet by firing it into a ballistic pendulum and noting the displacement is one, the demonstration by means of eggs, raw and hard-boiled, to prove the solidity of the earth's core, is another. In the first, the loading of the old blunderbuss was ever a signal for hilarity. In the second lay, at least on one occasion, the opportunity of the practical joker. After suspension the eggs were spun merrily, the raw egg slowing down while the boiled one continued its course. Thus was it proved that if the earth had a liquid core it would be stopped by internal friction. On the occasion referred to a waggish student supplied two raw eggs for the experiment, and awaited the professorial chagrin.

"None of them boiled," was the laconic comment; the demonstrator was not to be so easily taken in.

One might digress into innumerable by-paths of Lord Kelvin's history. To venture on a few, it may be stated that he was born in Belfast, his father being Dr. James Thomson, professor of mathematics in the Royal Academical Institute in that city, who, in 1832, was appointed to the chair of mathematics in the old College of Glasgow. Here, as William Thomson, Lord Kelvin made a first bid for his honours and title by entering college at the age of eleven, astonishing the older students by his preternatural talents for mathematics. Among his contemporaries were Norman Macleod, David Livingstone, and Principal Caird. His master in astronomy was Professor Nichol, the friend of De Quincey. At the age of twenty-one he was Second Wrangler and Smith's prizeman at Cambridge; the Senior Wrangler, according to one of the examiners, being "unworthy to cut Thomson's pencils for him." While a member of St. Peter's, he proved himself a capable oarsman, winning the Silver Sculls. Later he entered the laboratory of Regnault in Paris, and in 1846 returned to Glasgow to occupy the chair of Natural Philosophy, which he held until his voluntary retirement in 1899. He was knighted, on the completion of the submarine Atlantic telegraph, in 1866, and raised to the peerage in 1892. He has more honorary degrees than any scientist living. Even Burke jibs at chronicling the list. It includes an M.D. from Heidelberg University that was mentioned to the discomfiture of a cross-examining lawyer in a memorable "electric belt" case.

Much more might be told, but the original intention of this article falls to be fulfilled,

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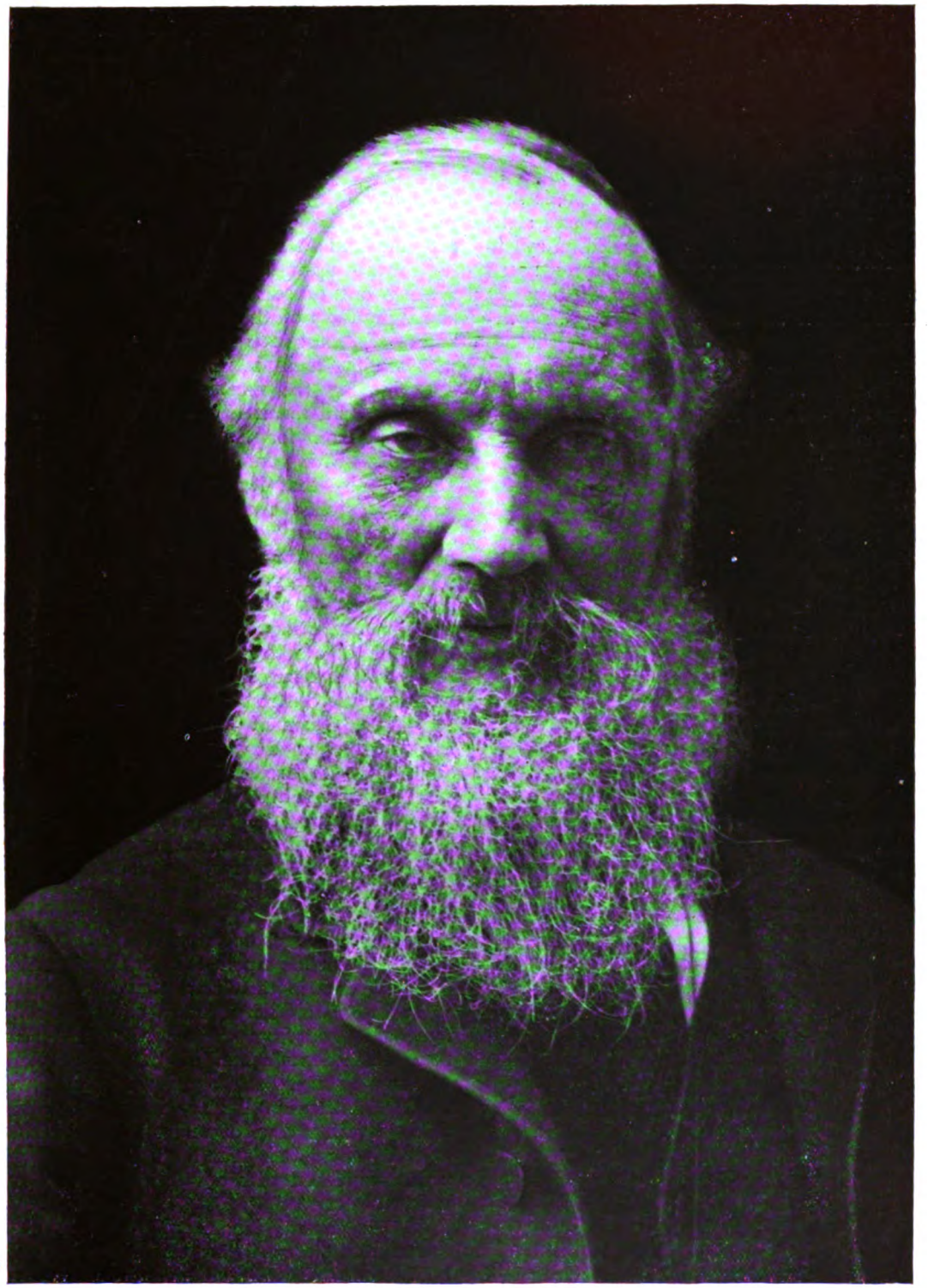

Annan

THE RIGHT HON. LORD KELVIN, O.M., G.C.V.O., D.C.L., LL.D., F.R.S., P.R.S.E.

"Gentler knight never broke lance."—HUXLEY

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namely, the description of the commercial laboratory and factory in Glasgow, carried on under the name of Kelvin and James White, Ltd., of which Lord Kelvin is the surviving original partner. Situated not inappropriately in Cambridge Street, which turns off northwards from Sauchiehall Street, the premises are entered through an unpretentious shop, in which no little part of the business done is that of supplying spectacles to citizens whose sight is faulty or failing, but who have still an eye to see where the best bargain in glasses based upon an accurate scientific basis may be obtained. Here also one meets nautical gentlemen bent on inspection of compasses, chronometers, and sounding machines; mining engineers and surveyors critically examining the instruments of their profession, electricians of all classes and from all corners of the globe making initial inquiries that may lead to their introduction to the wholesale department or the inner chamber. The casual visitor to Glasgow passes the shop unaware of its importance or of the magnitude and extent of the business done in it and in its immediate vicinity. The workshops to the rear employ over 400 hands, and were not the appliances for the saving of labour the most modern—many of them the outcome of the master-mind controlling the business—that number would be more than doubled.

In the compass room are seen the perfected examples of Lord Kelvin's compass and deep-sea sounding machine, the latter fresh from tests conducted by means of an iron tube of water permanently erected in the well of the staircase of the building—an accommodating idea that obviates the necessity for continual trial trips in the estuary of the Clyde. It was these instruments which on their first being submitted to the Admiralty were rejected as impossible toys! They are now used in all the navies of the world and among the acknowledgments of their usefulness and accuracy is included a quaint parchment from naval headquarters in Japan. One can pass from the compass room through eleven machine and fitting-shops, all equipped with the most up-to-date contrivances for the turning out of some component part of the many products of the firm. What is perhaps one of the most interesting departments is the wire-winding room, in which girls are employed in fashioning the most delicate parts of instruments in themselves of a most delicate nature. Here, for instance, are wound the wire-coils—with wire less in thickness than a human hair—that form part of Lord Kelvin's famous "siphon recorder." This instrument writes the messages that pass over the submarine cables throughout the globe. It was the outcome of experiments with the "mirror instrument," at one time solely used for that purpose, consisting of a tiny magnet fixed on the back of a mirror no larger than a threepenny bit, and suspended by a spider-like film of silk in the centre of a coil of insulated wire, and with a beam of lamplight reflected from the glass upon a white screen. When the current passed through the coil, the movements of the mirror moved the disc of light on the screen, enabling the telegraphist to read the signals that went to the making of the message. It had one fault, however, no permanent record of its message was obtained. The "siphon recorder" filled in the deficiency; it not only takes the message, but it also marks the code on the telegraphic tape. It is for these machines the girls seen in the illustration are preparing the mechanism, the sensitive nature of which may be judged from the fact that on the complete instruments a message has been signalled to America and back again with the current from a Lilliputian battery made in a lady's thimble with a drop of acidulated water and a grain of zinc. It is even held that the feat can be accomplished with a voltaic cell made in a percussion cap.

THE WIRE-WINDING ROOM

Where girls are employed winding the wire-coils that form part of Lord Kelvin's "siphon recorder"

In the general laboratory the instruments (principally electrical) are tested and standardised. Brought in mechanically correct from the works, they are compared with standard instruments. Ammeters for measuring current, voltmeters for measuring pressure, and

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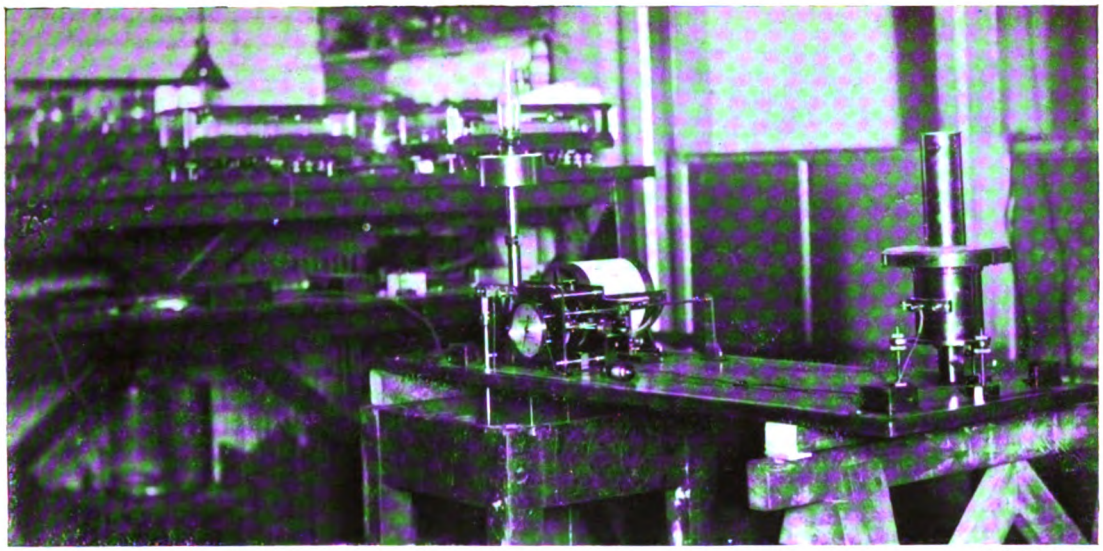

G. B. Primrose

LORD KELVIN'S EXPERIMENTAL LABORATORY

The instrument here shown is for indicating electricity in the atmosphere

wattmeters for measuring the total power in a circuit are to be seen here. When these have passed the crucial stage of examination they indicate and, if need be, record on a ruled chart the particulars the engineer may desire to know. Measurements can be made in pressure from .001 of a volt up to 100,000 volts, and in current from .001 of an ampere to 10,000 amperes—this, of course, necessitating a combination of instruments.

Adjoining the general laboratory is the experimental room. It is in this room one comes across inventions in embryo. That in the illustration, however, is far advanced. It is a machine for indicating electricity in the atmosphere—one of three in existence. The order for the first came to Lord Kelvin from Kew Observatory, the second from the Coats Observatory, Paisley, and the third, not yet fulfilled, from Egypt.

In the main electrical department of the works some of the largest switchboards in the world have been put together, and taken down, to be refitted up in places throughout the Empire. At present the department is finishing one for power and lighting at Chatham dockyards. It has furnished during the past few years, among others, those for the Bengal Nagpur Railway Company, the Natal Government Railways, the Central South African Railway Company, &c.

A gentleman intimate with Lord Kelvin's movements once chronicled what constituted two 'days' work. The chronicle was as follows: First Day.—Returned from Edinburgh in the morning, overtook arrears of correspondence with assistance from his Secretary; lunched; consulted with experts details of plans for the lighting of a town by electricity; spent an hour or two in the drawing-room with Lady Kelvin receiving visitors; dined; made elaborate calculations as to the laws governing the formation of crystals till late. Second Day.—Rose early; lectured at nine o'clock to the students on Kepler's Laws; drove to White's to make final tests with a new electrical meter; drove back to the University and lectured on Higher Mathematics; lunched; consulted electrical experts on private business; dined; studied crystals once more until bedtime, and next morning took the train to London to attend a meeting of the Royal Society, of which he was the distinguished President. Happily, his physical power was in keeping with his mental activity. He has lived a goodly time beyond the allotted span, but his mental powers are unimpaired. In the directors' room there stands a weird contraption, on which on the occasion of his last visit to Glasgow Lord Kelvin worked as he did over twenty years ago when first the idea of the particular machine—one for solving certain equations mechanically—came into his head. Although an evolver of wonderful theories he is no bigot, and the failure of an invention to prove successful in the light of clearer knowledge sees that invention conveyed to the scrap-heap and its originator calmly turning to some new pursuit.

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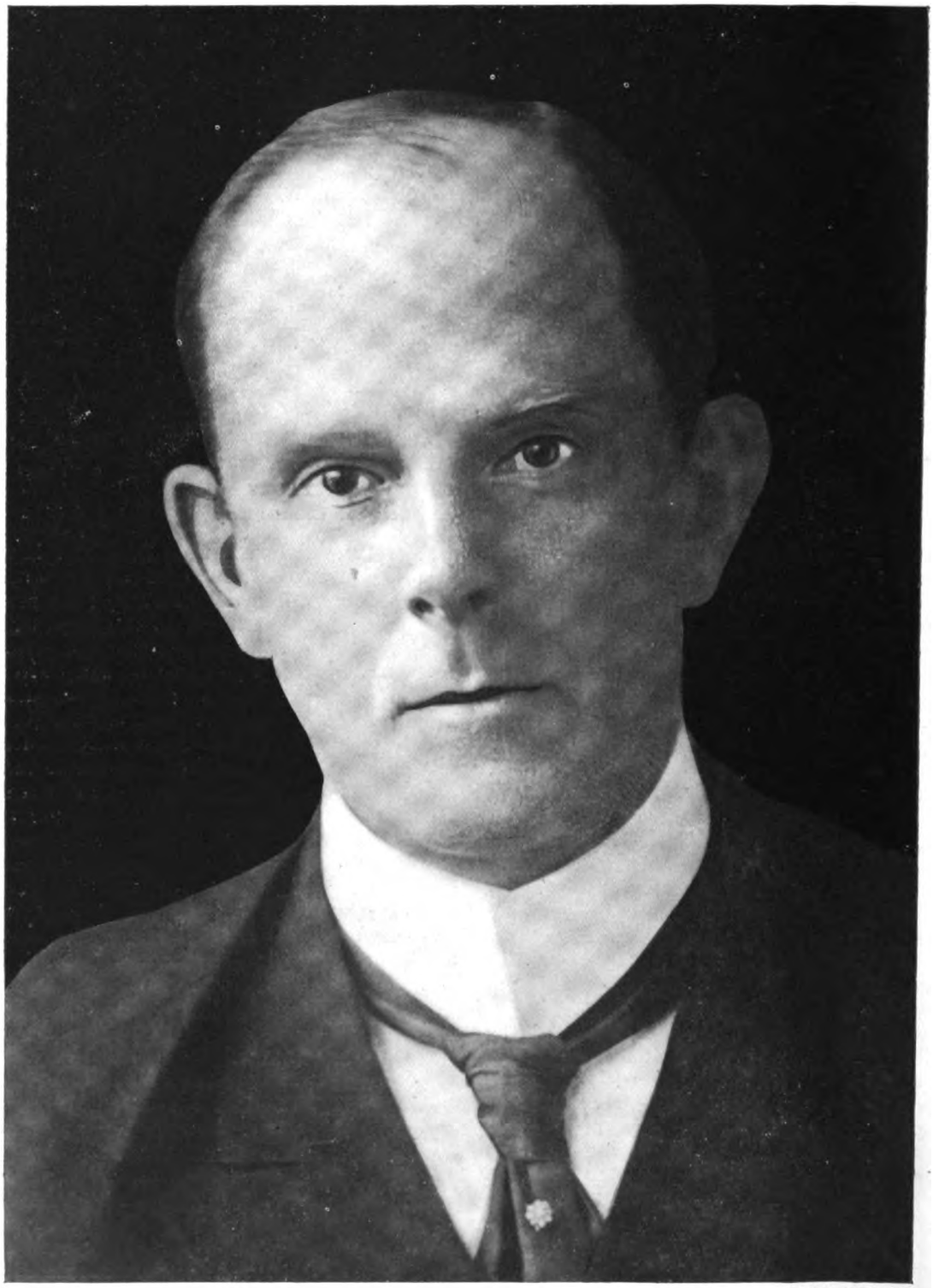

Kent and Lacey

MR. ERNEST AMHERST VILLIERS, M.P.

WHO HAS JUST WON SO REMARKABLE A LIBERAL VICTORY AT BRIGHTON; GREAT-NEPHEW OF CHARLES PELHAM VILLIERS, THE GREAT FREE TRADE LEADER

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THE MARCH OF EVENTS

PARLIAMENT AND PRIVATE MEMBERS' MOTIONS—UNANIMOUS CONDEMNATION OF BOTH THE PRIME MINISTER AND MR. CHAMBERLAIN—MR. BALFOUR'S DISRESPECT FOR THE HOUSE OF COMMONS—THE BUDGET—THE UNIONIST SPLIT —THE BRIGHTON VICTORY

BY

HENRY NORMAN, M.P.

DURING the past month the House of Commons under Mr. Balfour's leadership has taken another long step downwards. The country has been treated to the unprecedented spectacle of a unanimous vote condemning the attitude of the Prime Minister, he himself not being in his place and his followers being informed that they had better absent themselves. Last month Mr. Chamberlain's scheme of attempting to secure the unity of the Empire by the protective taxation of food was met by the Government by the motion "that the question be not now put," which was carried by forty-two. Next it was the turn of Mr. Chamberlain's protective proposals. The motion read as follows:

"That, in the opinion of this House, the imposition of a general duty on all manufactured goods imported from abroad not exceeding 10 per cent. on the average, and varying according to the amount of labour in these goods, would be injurious to the commercial interests of the United Kingdom."

In order to get a division upon this, it was necessary that two Liberals should act as tellers, and only two Conservatives were found to vote for it, the vote being 254 to 2. As Sir Henry Campbell-Bannerman wittily said, the first stage was the shut door, when we were refused any proper discussion of the fiscal question; the second was the side door—the "previous question"; and this, the third, was the back door.

Next, Mr. Balfour's own scheme was brought forward in the following motion:

"That in view of the declaration made by the Prime Minister, this House thinks it necessary to record its condemnation of his policy of fiscal retaliation."

This was carried unanimously; that is to say, in a House crowded upon one side a direct vote of censure was passed upon the Prime Minister, and he did not trouble to be present. It has hitherto always been the custom for Ministers to be present at the discussion of private Members' resolutions, and even when they left the House free to vote as it liked they have always taken part in the debate and expressed their own views. Simply to ignore the discussion altogether is without precedent, and is obviously treating the House of Commons with contempt. Mr. Balfour, however, went much further than this. Next day a question was put to him by Mr. Churchill in the following words:

"Whether his attention has been drawn to a resolution standing on the journals of this House which runs as follows: 'Resolved, *nemine contradicente*, that, in view of the declaration made by the Prime Minister, this House thinks it necessary to record its condemnation of his policy of fiscal retaliation'; what precedents can be cited in favour of a Government ignoring such a resolution; if he proposes to ask the House to expunge that resolution from its journals, and, if so, when, or whether, if the resolution stands, he considers retention of office consonant with his public duty or personal honour."

In reply to this Mr. Balfour said he regretted that notice had not been given of this question, because "at present my sole knowledge is derived from the question the honourable Member has put to me." That is, the Prime Minister deliberately stated that at three o'clock on Wednesday he was not aware of a unanimous vote of the House of Commons directed against himself at midnight on Tuesday. This means, of course, that after the debate on Wednesday no official made any communication to him, that no communication was made during the whole of Wednesday morning, that he did not glance at a single newspaper, indeed, that he did not meet a single political acquaintance,

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for the vote of the House was the all-absorbing topic of political conversation, and it is unthinkable that a political friend of the Prime Minister could have spoken to him on political matters without alluding to it. Mr. Balfour's statement is one upon which it is almost impossible to comment, and the darkness is made deeper by the fact that Sir Alexander Acland-Hood, the chief Whip, stated shortly afterwards in the House that he had informed the Prime Minister of what had taken place, although upon being pressed he added that he did not tell him the precise terms of the resolution but only the general purport of it. The precise terms of the resolution had, of course, been common property for some time before. Finally, it is the traditional duty of the Prime Minister to write a letter every day to the Sovereign giving in a few words information upon what has been done in Parliament. One of the most familiar spectacles of the House of Commons some years ago was Mr. Gladstone writing his nightly letter to the Queen upon a writing-pad held on his knee. It must therefore also be that Mr. Balfour has departed from this custom. Nothing like the above facts has ever been known in connection with Parliament before. Never has a Minister treated it with such flagrant and deliberate disrespect.

Two similar motions were moved on subsequent days in the following words :

"That, in the opinion of this House, grave injury would be caused to the shipping industry and to other industries dependent thereon by the adoption of the changes in the existing fiscal system proposed by the right honourable gentleman the Member for West Birmingham.

"That this House disapproves on principle of the taxation of corn, meat, and dairy produce, as being especially burdensome to the poor and injurious to the welfare of the nation ; and believes that no proportionate remission from existing duties on tea, sugar, coffee, and cocoa would afford compensation for the imposition of such taxes ; and declares its opinion that any Colonial Conference that is entered upon, except on the understanding that this country will not agree to the taxation of corn, meat, and dairy produce, will result in failure."

Each of these resolutions was carried unanimously, practically the whole of the Liberal and Irish parties being in attendance. Sir Henry Fowler, whose fellow-townsmen, by the way, have just celebrated with great distinction the twenty-fifth year of his Parliamentary service, and of whom we give a portrait this month, expressed the opinion not only of every Liberal, but of a large number of the more serious Conservatives, when he spoke as follows :

"What they were face to face with was an unprecedented attack upon the rights, the privileges, the prerogatives, and the freedom of the House of Commons. Who had endowed the present Government, or any Government in this country, with the right to prescribe limits to the discussions of the House of Commons ? Who had given them the authority to say that if they absented themselves from the House, if they declined to take any part in the matter on which the House was proceeding, that discussion was of no value, and ceased to be a discussion in and a decision of the House of Commons ? He was under the impression that with Mr. Speaker in the Chair, with the mace on the table, and with a quorum of members, there was the House of Commons."

Mr. Balfour's action was also too strong for some of his newspaper supporters, and even the *Daily Mail*, the most slavish adherent of the Government, stated next day that "it is impossible to deny that these events have produced a feeling of amazement in the country," and added :

"Such a situation has never before, we believe, been paralleled in the history of Parliament. It would certainly seem to the observer that a grave error was committed in ignoring Mr. Walton's resolution, even though a precarious tactical success was scored by refusing to disclose the division in the Unionist party, which, we fear, is the true explanation of the line of policy adopted."

The *Spectator*, which is consistently Unionist, though of course strongly for Free Trade, expressed what must surely be an almost universal view that the Members of the Government have suffered a grievous loss of personal dignity by their action in this and other matters ; and that in communities where unwillingness to suffer a loss of personal dignity does not exist, political life becomes degraded. The other examples to which the *Spectator* justly points are that Lord Stanley, Postmaster-General, personally promised to speak for Mr. Bowles at King's Lynn, and then withdrew from his promise when pressure was brought to bear upon the Prime Minister by Mr. Chamberlain's followers ; and that when Sir Alexander Acland-Hood had written to the Unionists of Greenwich in support of the candidature of Lord Hugh Cecil, and stated Mr. Balfour's opinion to be that the Fiscal Question did not afford a test of party loyalty, Mr. Chamberlain wrote a letter to the Greenwich electors advising them to vote for Lord Hugh Cecil's opponent, and Mr. Balfour took no notice of this open political humiliation. Ministers, adds the *Spectator*, "seem, indeed, to be animated by a

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spirit which suggests a parody of the legendary cry of the Old Guard at Waterloo. The Old Guard at Downing Street will receive any number of kicks, but will never resign."

* * * * *

The Budget can be summarised in a sentence. There is an estimated surplus of £2,972,000. This is disposed of as to £2,000,000 by an increase in the Sinking Fund, and as to £1,550,000 by a remission of twopence per pound duty on tea.

This Budget has been received, somewhat hastily, as it seems to me, with a certain amount of Liberal approval. One thing is indeed to be said for it, that there is nothing basically unsound in it. But its most striking feature is that the Government have not to any substantial degree reduced the enormous expenditure of this country, which still stands practically at a war figure. Secondly, their surplus was only acquired by the unusual "hustling" of the income-tax payer and by the sale of a very large number of ships, some of which are comparatively new, while others have only recently been repaired at a huge cost. In the third place, it exhibits of course Mr. Austen Chamberlain's complete falure to redeem his pledge with regard to income tax, a pledge given soon after he became Chancellor, in these words:

"When the time came, if come it did, when taxation had to be taken off, surely the income-tax payers deserved some consideration, for the income tax was our first and greatest reserve in case of war. It was upon the income-tax payer that the heaviest burden fell, and fell most immediately, when a great crisis broke out, and it was against all canons of sound finance and the teaching of all the great Chancellors of the Exchequer to maintain the income tax at the figure of 11*d.* or 1*s.* in times of peace, unless it was absolutely required."

His excuse is that to have taken a penny off the income tax would have absorbed the whole of his surplus. But against this it is perfectly just to urge that a competent, not to say brilliant, Chancellor would have attempted the long-desired graduation of the income tax, which would have been a great relief to the small income-tax payer at the expense of the wealthy one, and would have made an attempt to differentiate the tax as between incomes personally earned and unearned. From a Liberal point of view, further, there are several new taxes which might with perfect justice have been proposed. Such, for instance, as a small tax upon the selling value of land, recently urged with great force by Mr. Whitley in our columns, and an increased tax upon licence-holders doing a very large business. Finally, with regard to the tea duty, all there is to be said is that the Government takes off as from July 1 next the tax it imposed last year. Needless to say, the small income-tax payer will be very dissatisfied indeed, and his dissatisfaction will not be lessened by some of the comments he reads in the Government Press. The *Times*, for instance, writes as follows:

"Income-tax payers will be disappointed, and have some right to be disappointed, at his failure to give them any relief, especially after his declaration a year ago that they have the first claim upon a surplus. They are always treated to the fine words which butter no parsnips, and are always assured that it is really a danger to the State to go on skinning them in time of peace to such an extent as to leave little integument to remove in time of war. But they are taxed all the same, both to avoid piling up debt in war and to pay off what has been incurred."

And the *Morning Post* takes the same line:

"The income-tax payer had to bear the brunt of the war expenditure, and he is still bearing the brunt of peace expenditure. He is the scapegoat who has to suffer for the narrow basis of our fiscal resources. This year, moreover, he has not even the cold comfort of a promise to render the incidence of the tax more equitable. In each of the past few Budget statements it has been sought to cheer the weary income-tax payer with an assurance that inquiry was being set afoot as to the inequitable incidence of the impost, but these promises have as yet borne no tangible fruit, and the income-tax payer is left disconsolate and protesting."

Great interest was excited as to whether Mr. Austen Chamberlain would present a "dissolution Budget" or not, and opinion generally is that he has not done so. I do not feel sure that this opinion is right. There has been no attempt to catch votes in it, but the question may fairly be discussed whether a vote-catching budget does a Government more good than harm. And in the second place, this is the kind of budget which, if a dissolution should come, a Government would be glad to have presented. It is well known that Mr. Joseph Chamberlain, whose devotion to his son's political welfare is as conspicuous as it is charming, would do nothing to dissolve Parliament before Mr. Austen Chamberlain had had the opportunity of establishing his reputation as a sound and responsible financier. This has now been done, and to that extent, from the Chamberlainite point of view, an obstacle to dissolution has been

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removed. At the moment of writing it has at last become evident that the Unionist Party cannot last much longer, in spite of Mr. Balfour's attempts to hold on to office at any cost, in view of the daily widening rupture between the followers of Mr. Balfour and those of Mr. Chamberlain. Therefore, a frantic effort is being made to bring about some common ground on which the two can appeal to the country from the same platform. Meetings and dinners and speeches in private are being held to bring this about, the Chamberlainite press is being vigorously employed in the enterprise, and tariff reformers are assuming an air of confidence that it will succeed. It will not succeed, for the simple reason that the Balfourian party know that the Protective taxation of food spells ruin, and that Mr. Chamberlain, often as he has changed his opinions, cannot possibly repudiate his statement that a system of Colonial Preference is impossible unless food is taxed, without rendering himself and his whole campaign wholly ridiculous. It is in this fact that the probability of a dissolution before the end of this session lies.

Furthermore, the breach between the two sections of the Unionist Party has been emphasised by another fiscal debate in the House of Lords, chiefly on the subject of the Colonial Conference. Mr. Balfour desires that a general election shall take place upon the issue whether a Colonial Conference shall be called to discuss Preference, and that if it decides upon such a policy another general election shall be held upon that issue. Mr. Chamberlain, on the other hand, desires that a Conference shall be called now, and that the issue shall be settled by one general election immediately following the decision at which the Conference may arrive. The Lords debate appeared to show that Mr. Balfour is inflexible upon this, and as two general elections in all human probability would postpone the final decision to a date at which Mr. Chamberlain can hardly expect to be still leading his section of the party, it is presumed that he will be equally inflexible for his own view. If this be so, then the breach is irreparable, and if there are Chamberlainites in the House of Commons sufficient in courage to vote against the Government, and sufficient in number to turn it out, a dissolution will take place shortly. Both Lord Lansdowne, however, and the Duke of Marlborough, Colonial Under-Secretary, appeared clearly to throw over Mr. Chamberlain's scheme of a Conference, as they declared that this must be practically unfettered in its decision, and that representatives of India, the Free Trade Colonies, and the Crown Colonies are to be present. Such a Conference, it is needless to say, would never declare for the taxation of food. Lord Lansdowne also added that it was idle to pretend that the colonies would wipe out their own protected industries. The Conference, both he and the Duke of Marlborough said, was to set forth anything the colonies had to propose—a statement which completely disposes of Mr. Chamberlain's contention that they have already made an offer.

Still, it is obvious that Mr. Balfour means to stay in office if he possibly can. And his inspired representatives are declaring that the gravity of the international situation renders it absolutely necessary that the Unionist Party should remain in control of the country's policy. From a party which has the withdrawal of the ships from Port Arthur, the narrowly escaped breach with the United States about Venezuela, the Yangtse agreement with Germany, and Mr. Chamberlain's exhortation to France to mend her manners, his comparison of the size of Germany and that of Queensland, and Mr. Balfour's speech at Southampton about the Dogger Bank incident, to its discredit, this can only be regarded as amusing. But it has always been the habit of a Conservative Government to get office and keep it on matters of foreign policy, and then to use its tenure of office to pass reactionary and class-favouring domestic legislation.

* * * *

I have only space to record the extraordinary result of the Brighton election. A Conservative majority of 2600 was changed into a Liberal majority of 817—the first Liberal Member to get in for Brighton for more than twenty years. Mr. Gerald Loder was appointed to the vacant post of Government Whip because it was supposed that his seat was absolutely safe beyond question. He is now the second member of the Government without a seat, the other being the Scotch Solicitor-General. The victor in this extraordinary triumph for Liberalism and Free Trade is Mr. Ernest Villiers, M.P., of whom we give a portrait this month, great-nephew of Charles Pelham Villiers, the first and greatest of the band of original Free Trade leaders. Mr. Villiers is the brother of Major Hyde Villiers, the Chamberlainite candidate for South Wolverhampton.

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MY EDUCATION AS A MOTORIST

EARLY ADVENTURES — THE AIR-COOLED QUADRICYCLE — A RIDICULOUS MACHINE—THE TWO-CYLINDER CAR—SATISFACTORY EXPERIENCES—ADVANTAGES AND DISADVANTAGES OF THE FOUR-CYLINDER CAR

BY

AN AMATEUR

WHETHER my experiences as an automobilist have been more chequered or less so than those of other men I am quite unable to say, but at the Editor's request I may detail them for what they are worth. As a looker-on I began very early, for I was present at the memorable automobile demonstration, so interesting yet quaint, which was given by Sir David Salomons at Tunbridge Wells in 1895. From that time onwards I have had more or less relative experience of many motor vehicles, but will confine myself in this narration to those with which I have had more intimate acquaintance as owner.

My first purchase was a motor quadricycle, fitted with a 2¼ h.p. engine. It was ready for delivery in the middle of January, when the roads were inches deep in mud. With a friend, however, I started off to fetch it from the factory, more than 160 miles from my home. At that time I knew absolutely nothing about the management of the machine. My friend was not much wiser, but as he had ridden a motor tricycle on two occasions he thought he could manage to drive the "quad." We took care to have the lubrication, etc., explained to us at the factory, and left in a downpour of rain. As it happened, however, the people at the works had only an imperfect acquaintance with their product, and it was not until the engine had got badly overheated that we discovered that we had been carefully told the wrong way to turn the tap on the oil reservoir. Thus when we pressed the plunger no oil went through into the engine. What with short circuits through the rain and mud, and trouble with the engine, our progress on the first day did not amount to more than sixty miles, and we were reduced to putting up at an inn of much primitiveness.

The next day's adventures I can afford to recall with amusement, though they were none the less trying to a degree of concentration which I have never since experienced on any other vehicle. Our road lay over the famous Edgehill, which was not only heavy with mud, but was covered with lengthy patches of new metal. Of course the "quad" was utterly unequal to making the ascent on its own power, and had to be hauled up. In those days exhaust valve lifters had not been invented, nor did we even know the trick of propping up the exhaust spring with a coin; consequently we had to pull the machine, weighing well over three hundredweight, up one of the steepest hills in England, and against the compression of the engine. Though we procured a rope, and though my companion was a powerful athlete, the task of getting the machine to the top of a hill a mile long, much of which had a gradient of 1 in 8, was well nigh superhuman. As it was mid-winter we were swathed in heavy clothing, quite unsuitable for hard work, and what with the thick mud and loose stones we could only move the machine a few yards at a time without being exhausted. To the best of my recollection it took us about an hour to reach the summit.

Then we drove to Aylesbury, where we stopped to overhaul the machine, and, after giving the engine a complete flushing with paraffin, we got it to work fairly well. We had still fifty miles to do, however, and our troubles were by no means over. First of all the chain broke, which meant, of course, that every time the "quad" was stopped from any cause it had to be restarted by a push, followed by an acrobatic jump. Early in the day we had removed the rear brake, as the muddy state of the roads caused it to bind on the drum; and when about twenty miles from home the front brake broke. To make matters worse the switch connection in the handle became useless. It was now quite dark, and we enjoyed the luxury of driving along the narrow roads

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from Brentford to Twickenham and over Kingston Bridge to Surbiton on a machine which had no chain to start it with, no brakes to hold it in when started, and no switch with which to vary the control; in fact, the speed could only be varied by means of the mixture levers. The delirious delights of the final stage reduced my friend to a state of absolute collapse, whilst my own nerves were fairly well strung up in the effort to pierce the gloom in order to sing out instructions to the driver.

Five months' usage of this machine was quite sufficient for my liking. I had some amount of sport out of it, but the perpetual tendency of the contact-breaker to collect oil, with resultant short circuits, and the immense muscular labour involved in pedalling the machine when its own power was insufficient to take it over the crest of a hill, were quite sufficient to cool my ardour within that comparatively short period. I put more hard work into pushing this "self-propelled" machine—save the mark—than in the whole of my career as a cyclist, though I had ridden many thousands of miles, and as much as two hundred miles within twenty-four hours. One incident in particular I shall never forget. I had driven the machine down to a station to await a train by which I expected my wife to arrive. Owing to a missed connection, however, she was an hour late, and meanwhile an unusually heavy snow-storm had come on. In a very short time it almost buried the machine. When the time came to move I could not get the engine to start owing to short circuits, and the fact that the spring of the exhaust valve was absolutely choked up with snow. My home was a mile away, at the top of a long hill, and the labour of pushing the machine single-handed through the heavy snow was so severe that I suffered from the effects for several days.

A more unmechanical vehicle than the quadricycle in its first guise, with a ridiculously small engine, no means of running it free, no reducing gear, and the air-cooled motor getting weaker through heating when power was most required, has never been produced in the whole history of automobilism. To this day I am at a loss to understand the mental equipment of the original designers of this wonderful monstrosity, unless they sold each particular machine with a proviso that it was only to be employed on level surfaces. In the light of present experiences, when we all know how essential is a change-speed gear even to a powerful car, the idea of sending out a two-passenger vehicle without any such device, and with only a liliputian motor, appears ludicrous in the extreme.

For some time afterwards I was again content to play the part of a looker-on, but eventually fell in love with a two-cylinder car of 7 h.p., which had just been put upon the market. I had to wait several months, however, for delivery, as was the usual state of things at that time, and chilly November had arrived before the car came into my possession. Naturally I made early acquaintance with a side-slip, and the eerie feeling of suddenly floating, as it were, in space. No harm, however, resulted, and the experience was valuable, for I never had another skid. I may say at once that the car was a wonderful goer, and when I look back upon the amount of pleasure I derived from its use during a period of nearly two years, it amazes me to encounter, from time to time, people who are still awaiting the advent of the "perfect automobile." I learned to drive it almost without instruction, and on the Easter Monday following its purchase I drove no less than 165 miles in one day.

My mechanical knowledge was quite inconsiderable, and I had had no experience whatever in car driving, while the preliminary handling of the "quad" had taught me nothing beyond how to clean a sparking-plug and grind a valve. Nevertheless, I never had to abandon a journey except once, and that was due to the fact that at the time the car was built the makers were experimenting with various types of carburetter. Mine proved to be a bad one, and had to be changed. The new one was very different, however; the engine always started at once, and on the road I never had to give the carburetter a thought. I may explain that it was of the automatic type, and that I had no air lever to bother with. In addition to changing the carburetter I had to have the timing gears altered eventually, as they were of the three-pinion type, and by substituting two pinions only, of larger diameter, one got quieter running, and no double wear on an intermediate pinion. This change, however, involved the fitting of a new front axle, as the larger pinions bumped on to the old one when going over rough ground.

Only twice while I had this car was I really puzzled. In the first instance, I found the engine back-firing, and narrowly escaped a nasty knock when starting up. This was merely due to the rounded ends of the contact blades on the commutator having worn flat after about a thousand miles or so of running, the

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said wear being sufficient to affect the timing. I got a new pair of blades, but they were not exact duplicates of those which were worn, and I had to send for a man from the factory to adjust the timing for me. As a matter of fact there ought not to have been any difficulty; but this was one of the many cases I have encountered in which trouble has been caused to the amateur owner, not from any defect in principle or design, but from sheer carelessness at the factory.

On the other occasion I had descended a steep hill at a fast pace, and was swinging up the opposing rise. When the momentum had subsided, and it was time to change speed, I found that I could not get in my second speed, and stuck on the middle of the hill. There were plenty of automobilists about at the time, as I was on a Club run, and every one was of opinion, including the maker of the car, who happened to be there also, that something had gone wrong inside the gear-box. Subsequent examination showed, however, that all that had happened was that the quadrant itself had slipped round slightly on the steering standard to which it was attached, so that the notches were in the wrong place. I do not recall any other incident of moment, and considering my own lack of practical knowledge at that time, and the date at which the car was built, I may regard the latter as having been a very satisfactory possession.

My experiences showed me clearly enough that, provided a small motor-car is made with a careful attention to detail, its handling and general management are well within the powers of the ordinarily intelligent person, who needs to have had no mechanical training whatsoever. Of course every man has to learn how to overcome his initial lapses, such as forgetting to fill his tanks, or to put his switch on before starting the motor; but these operations soon become instinctive. The things above all others that give annoyance to the amateur are the nuts that strip, badly made water connections, flimsy wiring, and other items that may be faultily fitted. No greater mistake could be made by the would-be purchaser of a small car than to suppose that it is difficult to understand the principle of its construction. It is not, it is true, reduced to that state of absolute simplicity which is represented by the pressing of the button of an electric bell, but it is unquestionably the reverse of complex or abstruse.

When I sold the car in question I had already ordered a four-cylinder vehicle of double the horse-power. Though I had placed the order in the month of August I did not receive the car until six months later; and let me say in passing that if it is disquieting to the would-be automobilst not to be able to afford the acquisition of a car, it is absolute purgatory for a motorist to be minus a car after having experienced the delights of actual possession. The practical utility of a motor vehicle, quite apart from the opportunities of pleasure which it provides, is borne home to one with irritating reiteration. However annoyed at times one may have been while in possession of a car, owing to whatever causes of trouble may have arisen, these are swept into insignificance, when one has no car at all, by the ever-present need of "getting about," and in the flood-tide of one's recollections of many delightful journeys on the road.

The new car when it arrived was positively imposing in its beauty, but was naturally a more serious undertaking in every way than the smaller one for an amateur like myself. I kept no mechanic, but simply hired a youth who came in every evening and cleaned the carriage-work and lamps. In course of time I taught him how to give assistance in sundry other matters, but never trusted him even to repair a tyre unaided. In the matter of driving I found a radical difference at the outset between the small and the large car respectively. The former was fitted with direct steering; in other words, the front wheels responded to the movement of the hand wheel in the same way as a bicycle wheel does to the movement of the handle-bar. In traffic this had its advantages, the steering being so quick, in fact, that with one finger only on the steering wheel I could drive round other vehicles, or even in and out of the central standards which disfigure certain tram routes. The larger car, however, had of course irreversible or worm steering. The amount of gearing down varies materially on different cars; on mine it was considerable, and at first I found it difficult to get round a corner. The pulling at the hand wheel, with almost as much double-handed vigour and range of movement as may be seen on watching the helmsman of a ship, appeared at first extremely and even ludicrously awkward; I thought I should never get the hang of it. As a matter of fact, however, it soon became perfectly simple, and I found, of course, that the car was infinitely steadier downhill, or at any other time when travelling fast. Direct steering, in fact, is undesirable and even unsafe at speeds above twenty miles an hour; one used to see small cars, while running at a

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faster pace downhill than they could ever travel on the level, which swayed considerably. Irreversible steering, however, is now fitted even to many small cars.

The good points of my new treasure were very good, the bad ones very bad. In comfort, as compared with the 7 h.p. it was as a Pullman car to a third-class railway carriage. With its long wheel-base and French springs I could drive over gulleys and level crossings with scarcely any retardation of pace, whereas on the little car I had to crowd on all the brakes every time that I came to the slightest obstacle on the roadway, for fear of being jerked out of my seat. At all speeds the large car moved as steadily as a train, yet with the sense of elasticity which only those who have enjoyed travelling on a pneumatic-tyred motor-car can understand. The four-cylinder engine, too, when properly working was a vast improvement in every way on the two-cylinder; the gentle purr of the former as compared with the "thud-thud" of the latter was music to the ears. Up-hill, too, I did not need to be half as adroit in changing speed, owing to the greater elasticity of the motor. Parenthetically I may add that the speed changes on that particular car were extremely easy, thus showing that it is not difficult to design a satisfactory system. Mine was of the ordinary Panhard type, and I could only conclude that in the case of cars in which the driver could not change speed without a jar or noise, the fault was in the cutting of the gear-wheels. Having been accustomed, by the way, to change speed with a short horizontal lever on the quadrant beneath the steering wheel, I thought I should find a difficulty in using the side lever. At first I had to watch the notches, but in course of time the sense of touch was ample, and it became as easy to change speed in the dark as in the daylight.

One good point which I came to realise about four-cylinder motors was that the possibility of being stranded was much more remote than on a two-cylinder, and still more so than with a single-cylinder engine. The motor might be sluggish, but still one could jog along, while if one cylinder cut out altogether, and the fault could not be located on the spot, one had still three cylinders at command. With a two-cylinder motor, failure of one cylinder means loss of half the power; while with the single-cylinder type everything must be working perfectly or the car will hardly move, and a broken plug or wire means total stoppage. No one, of course, would willingly drive any motor in an imperfect condition a yard further than he could avoid; but in certain circumstances it is a case of getting home with a multi-cylinder motor as against being "hung up" with a smaller type. It is satisfactory to be able to state, however, that these contingencies became fewer and fewer, and a stranded car is now seldom seen.

So far as handling on the road went, therefore, the bigger car proved itself superior to the smaller in almost every respect. Reversing with worm steering was child's play compared with the same operation on the direct-steered car, and among other advantages was greater steadiness in grease. I had somewhat feared by anticipation the extra speed, but found the new car absolutely easy to control even at its fastest. Nothing that I had dreaded was ever realised; on the other hand, I was destined to make unforeseen and unpleasant discoveries. The car was fitted with a thoroughly bad lubricator, of the drip type, and this gave me no end of trouble in the way of fouled plugs through over-dosing with oil, or heated engine through insufficient supply. No one could make the lubricator work with uniformity, and to make matters worse the engine was designed with a very shallow base-chamber, the theory being that no reserve of oil was needed, and that the drip feed was enough. All the more reason, therefore, was there for the fitting of a trustworthy type of lubricator, and five pounds more spent by the maker at the outset would have saved me an infinity of annoyance.

The car was chain-driven, and the cleaning and oiling of the chains took more time than I for one cared to give to them; and, though in theory I prefer chain transmission, the live axle type is less troublesome to the amateur who does not employ a mechanic. The car body, too, collects less mud. I kept the car nearly two years, and at the end of that time had the satisfaction of getting more out of it than at any previous time, for I drove it on the third speed up a long hill which I had often climbed, but never before without resort to the second. Now I await delivery of a 20 h.p. car. I chose it after seeing everything at the Paris Salon and the three English shows, and know enough by now of motor-cars to feel sure that *primâ facie* it is a sound article. I do not think that it ought to cause me any trouble; but of one thing I am quite certain, and that is that, if it does, the fact will be due to that lack of care at the works such as is as regrettable as it is far too common.

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THE COST OF KEEPING A SMALL MOTOR-CAR

ECONOMY, SIMPLICITY, AND ENJOYMENT—A MOTOR BUDGET SHOWING HOW TO KEEP A CAR FOR TWENTY-FOUR SHILLINGS A WEEK

BY

THE EDITOR

FEW topics, outside religion, politics, and their daily business, are of keen interest to so many people just now as the cost of keeping a motor-car. The following article upon the subject was written by me for the *Daily Chronicle* (March 25), under the circumstances described below, and as it may be of practical guidance to a very large number of my readers here, who may have missed that day's *Chronicle*, I now reprint it, with the permission of the Editor, and with the addition of certain reflections and details omitted for reasons of space in its original form. H. N.

It is not the initial cost of a car, but the fear that its annual upkeep will amount to a large sum, that deters thousands of people from buying one. This fact has been borne in upon me afresh by the shoal of letters on the subject evolved by the interview with me on "The Ideal Small Car," published in the *Daily Chronicle* a few weeks ago. Therefore I gladly accede to your request to deal with this question more closely and in detail than I have ever done before. I have considered the separate items very carefully for some time, before putting pen to paper, and I am sure that the following estimate is substantially correct.

Let it be clearly recognised, however, at the outset, that cost is a relative matter in at least two important respects—tyres and depreciation.

The following extract from the *Autocar* deals strikingly with one of these:

"An official of one of the great tyre companies recently told us that if four well-known gentlemen of our mutual acquaintance were to order identical sets of tyres for exactly similar machines simultaneously, he could foretell exactly the relative durability of all four sets of tyres, simply by virtue of his knowledge of the mechanics who looked after the respective cars."

Every student of motoring knows the moral of this remark to be literally true. Nothing is commoner than to see a driver, paid or amateur, dash up to the point where he wants to stop, and then clap on the brakes. That means a huge tyre bill. A fortnight ago I rode with a friend from the West-end to the City in a splendid car, fresh from the show at Olympia. "My man drives very well, don't you think?" he said to me. "He steers well, but drives badly," I replied; "your tyre bill will be very large." The man was running the engine very much too fast, and whenever there was a clear fifty yards in front he dashed ahead and then pulled up short behind the vehicle which blocked his way. It looked smart, and was ruinous. If your tyres are to last, you must drive "on the clutch" and not "on the brakes"—that is, let your car slow down by its own failing momentum, and reserve the severe application of the brakes for serious emergencies. The following estimate rests, therefore, upon the supposition that the car will be intelligently and carefully driven.

The car with which I propose to deal here is the petrol-propelled "small car." That is, a car costing under £200, of less than 10 horse-power, carrying usually two persons and three when required, driven by the owner, who is his own mechanic, and cleaned and washed by any gardener or odd man or handy lad. In my estimates nothing will be reckoned for wages or rent.

First comes the item of depreciation—the one most commonly omitted altogether. If your car costs £150, and you cannot get more than £50 for it after two years' wear (the advertising columns of the motor Press will teach you a great deal on this point), it will have cost you £50 a year for depreciation. This is no imaginary case, but it is wholly absurd and

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unnecessary. There is no reason why a small car, simply designed, conscientiously constructed, and of the best material, should not wear just as long as any other corresponding piece of machinery. Every student of motor manufacture can tell you exactly which car will last, and which will not. It is all a matter of material, draughtsmanship, and conscience. I assert without hesitation that a really good small car should be running, after the replacement of certain wearing parts, practically as well at the end of five years as when it was new. I would not myself dream of buying a car of which I did not believe this to be true.

Now, I take as the price of a good small car a sum for which it ought to be—and is—procurable, namely £185. And such a car, properly driven and cared for, should be a bargain at £85 after five years' reasonable use. Thus the first item in my budget will be £20 a year for depreciation.

Secondly, as regards petrol, the cost of this will, of course, be proportionate to the distance driven, one driver getting a little more mileage out of his gallon than another. I think that a hundred miles a week, all the year round, is a fair average. During many weeks a far greater distance—perhaps five times as great—will be covered, but during many weeks of winter or absence the car will hardly be used at all. A low estimate per gallon of petrol is twenty miles, and the cost retail is a shilling a gallon—less if you buy it in quantity. The second item, therefore, is 5000 miles at twenty miles per 1s. gallon—£12 10s.

Next we come to much the most difficult question of all—the cost of tyres. This question is full of uncertainties—luck, for instance, in not running over bottles, or happening often upon stretches of road covered with unrolled flints. No man will entirely agree with another man's estimate, but I have given much thought to this, and read virtually everything written about it in the motor papers, and I present the following with confidence as a fair statement of what may reasonably be expected under the conditions I lay down.

I have already spoken of the importance in respect of the cost of tyres of careful driving. One other consideration is no less vital: Every small car, and almost every big car, has hitherto been under-tyred. That is, from reasons of economy, the makers supply it fitted with tyres of a diameter too small for the weight they have to carry. Every tyre maker in the world will tell you that this is so, and expert purchasers of costly cars often begin by ordering tyres of a larger diameter than usually come with the car. (Of course, I am speaking of the diameter of the tyre regarded as a tube—not of the diameter of the wheel.) I have just bought for a friend a car the chassis alone of which cost £900, and the first thing I did was to order bigger tyres for two of the wheels. The profit on small cars is so small that makers not unnaturally, though certainly unwisely, economise by fitting the smallest tyres that will carry the weight at all. The under-tyred car suffers constantly from bursts and punctures; the over-tyred car does not so suffer—that may be stated as an axiom of motoring. Therefore, for economy in the tyre bill the small car must start with larger and more expensive tyres than are usually fitted. A car which weighs empty 1200 lb.—the weight of the Adams-Hewitt—should have heavy tyres of 90 millimètres—3½ in., as that car has. Often three passengers will be carried, and a certain amount of luggage, say, 500 lb. in all. That makes a total weight of 1700 lb. Now, "heavy car tyres" of 90 millimètres are sold to carry a weight of 900 lb. per wheel, that is, 3600 lb. in all. There will thus be a margin of no less than 1900 lb.—475 lb. per wheel—less weight than the maximum the tyre is built to carry. It is a practical certainty that a car thus over-tyred will run a very long distance before its tyres are worn out, and will be virtually free from punctures and other tyre troubles. (I leave solid tyres out of the question, as with a car thus adequately tyred it is unnecessary to suffer from their obvious and inevitable disadvantages.) Such tyres should run 5000 miles on a car properly driven before requiring retreading. Then they should run 2500 miles more. Then with one more retreading, they should run another thousand miles, or, in other words, such a tyre should cover 8500 miles in all, with two retreadings. That is the result I have reached from all the experience I have been able to gather from all quarters.

Therefore, thirdly, I work out the cost of tyres for the five years' use of the car whose budget I am estimating, as follows, the cost of tyres and retreading being those of Dunlop "heavy car tyres" of 760 by 90 millimètres. You start with four new tyre-covers and four new inner tubes. The covers run 5000 miles, and are then retreaded, at a cost of £1 14s. 3d. apiece—total £6 17s. Then you run 2500 miles, and your tyres are retreaded again—another £6 17s., and 1000 miles more. Then you buy another set of covers at £5 10s. 10d.

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apiece—total £22 3s. 4d., and run 5000 miles on them. Then £6 17s. for retreading, 2500 miles, £6 17s., and 1000 miles. Then £22 3s. 4d. again, 5000 miles, £6 17s., and 2500 miles. Total, 24,500 miles and £78 11s. 8d. Eight new inner tubes, making twelve in all, with the four new ones you started with, should be ample, as these may be repaired (by yourself) again and again. They cost £1 15s. 9d. apiece—total £14 16s. Thus the cost of tyres for your five years' running will be £92 17s. 8d., or, for a little margin, say £100—an average of £20 a year for the third item in the list. I believe this to be a perfectly reasonable estimate. It does not, of course, necessarily mean that you would run one set of tyres precisely 5000 miles, and then have them retreaded. That would depend upon how they were wearing. You would always have a couple of spare tyres, and frequently change them with those in use, for minor repairs at home, cleaning, and rest. It is very bad practice indeed to run a tyre to its last mile before having it retreaded. What I have estimated is the average life of a heavy car tyre, twice retreaded, of the size and carrying the weight I have specified.

The remaining items of the budget are easy to reckon. For supplies—sparking plugs, lubricating oil, grease, carbide, French chalk, &c., and charging accumulators (this last item ought to be trifling, as no car is properly equipped without two electric ignitions, and 90 per cent. of your running would be on the magneto, not using an accumulator at all) a sum of £7 a year should largely provide, while replacements and repairs should not cost £10 a year. Other items on my list speak for themselves, except that I may point out that the importance of insurance is not so much to cover injury to the car itself as to meet claims by the public in case of accident.

Thus, for the five years' use of a small car, costing £185 and running 5000 miles a year, we arrive at the following:

ANNUAL COST

	£	s.	d.
Depreciation	20	0	0
Petrol	12	10	0
Tyres	20	0	0
Supplies and Sundries	7	0	0
Replacements and Repairs	10	0	0
Inland Revenue Licence	2	2	0
Registration	1	0	0
Driving Licence	0	10	6
Insurance	5	0	0
	£78	2	6

Before discussing this total sum further, I wish to call attention to some budgets of actual experience. From recent correspondence in the motor Press I have summarised the following results of the use and upkeep of six cars of comparatively small horse-power, with the distances run and the actual cost per mile:

	Miles.	Per mile.
1.—12 h.p.	12,800	4d.
2.—10 h.p.	10,423	3d.
(Solid Tyres.)		
3.—10 h.p.	5,170	2d.
4.— 8 h.p.	3,256	2½d.
5.— 5 h.p.	5,360	1½d.
6.—10 h.p.	3,053	2¾d.

Now, these figures, apart from their own value, afford a curious—indeed, a very striking—coincidental confirmation of my calculations. The average of these six actual budgets from recent correspondence in the motor papers is:—Nine horse-power, 6677 miles run, and a cost of a fraction more than 2½d. a mile, not including depreciation. Deducting depreciation from the budget I have drawn up, it shows: Nine horse-power, 5000 miles run, and a cost of a fraction less than 3d. a mile. So far from having "arranged" this similarity, I did not discover it until I had completed the rest of the article.

Is there, however, no contra account to be reckoned? Assuredly there is. If the purchaser of the car has been accustomed or obliged to keep a horse and carriage of any kind the contra account will, in most cases, be larger than the cost of his motor, and under no possible ordinary circumstances that I know of (and horse-keeping and horse-training were my specialty for many years before I became a motor enthusiast) can a decent horse and vehicle be kept for less than £60 a year. For a doctor with a scattered practice, or any person, such as a road surveyor, canal inspector, or inspecting Army officer, who has regularly to cover long distances, there can be no possible question that a car is cheaper than a horse and carriage. In a few years the country doctor without a car will advertise himself as hopelessly out of date. But there is also a contra account for the car-owner who has never kept a horse. He cannot fail to economise considerably in railway, cab, carriage, and tramway fares. Whenever he goes into the country his car will transport him. His annual holiday will be spent largely on his car. When you are driving a horsed vehicle you must put it up at mid-day at a hotel, and have your own meals there, at the

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absurd prices most country hotels still charge for the simplest fare. With your car you will take delightful picnic lunches and teas by the roadside. It is reasonable, in my opinion, to estimate these total savings at a shilling a day all the year round—or say, to make the figures even, £15 2s. 6d. Thus we get:

	£	s.	d.
Total annual upkeep of car .	78	2	6
Annual saving	15	2	6
Net total cost of car . .	63	0	0

You can keep a small car for 24s. a week, total net cost. That is my conclusion.

Two more points, to complete the subject. First, nobody need hesitate to buy a good small car from fear that it is so complicated and mysterious that, lacking mechanical tastes or experience, they could not possibly keep it in order without expert assistance. A properly constructed small car, if the owner will read an elementary book on the subject and follow the makers' instructions, is easily within the comprehension of any fairly intelligent person. As I have said before, any man or woman who has not an adequate understanding of it after a couple of months' use ought to push a perambulator. The really good small car of to-day is so simple that to keep it in good order is a pleasant relaxation, and a woman can do this as well as a man. A dungaree apron, an old pair of gloves, a piece of selvyt, and about half as much thought as goes to the cutting out of a well-fitting frock or the playing of a decent game of bridge, are all that is required.

Finally, what a joy the possession of a car is! Till you have owned a car you do not know what life to-day may be—and the keenest pleasure in motoring is not that of the motorist sitting in a £1000 car behind a mechanic at £3 a week, but of the man or woman who takes care of the car and always drives it. In this case, blessed are the poor—in pocket. A circle of activity of 2827 square miles (the area of a circle whose radius is thirty miles); a new and astonishing accession of health and vigour; an unending panorama of delight in the country and the open road, ever changing with the seasons; a far more intimate knowledge of the land you live in, and therefore a greater and a more discerning love for it. These are some of the things that the ownership of a good small car will confer.

Let me say, in conclusion, that it will be a pleasure to me, and no trouble at all, to answer inquiries that may be addressed privately to me upon this subject. We motorists are all eager missionaries.

BY MOTOR-BOAT TO THE RIVIERA

A HOLIDAY IDEA FOR NEXT SEASON

ITS FASCINATION FOR THE OWNER OF A MOTOR-BOAT—TRAVEL ON THE WATERWAYS OF THE REPUBLIC FREE OF TOLLS OR DUES—CHARM, VARIETY, AND NOVELTY OF AN EIGHT HUNDRED MILES' JOURNEY IN FRANCE

BY

E. B. D'AUVERGNE

THE journey by water across France from the Channel to the Mediterranean has been more than once accomplished by yachtsmen, and should be of more frequent performance in these days of motor-boats and power-craft. It is certainly the most fascinating mode of approaching the Riviera, the route lying through the very heart of France and across some of her fairest and least-known provinces. The journey seems, too, a progression through time as well as space. It is winter when we leave the stern grey waters of the north, merging undistinguished with clouds as dull and forbidding; it is autumn when we pass down the waterways of Burgundy, between the vine-clad slopes and the forests in their bravery of red, russet, and gold; and it is full summer when, near our journey's end, we emerge into the dazzling sunlight of Provence, playing on the old marble

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homes of Romans and on the semi-African deserts of the Crau and Camargue. A voyage, then, well worth the making, but long enough in the matter of miles—eight hundred and thirty-seven miles from sea to sea, no less. But by an ordinarily swift boat this distance could be easily covered within a month—surely not too much to spare from the gaieties of casino and carnival for a sight of the great panorama of France which shall display the beauties of north and south and of all the intermediate stages; of a backward progress through three-quarters of a year?

Looking at the ordinary map with its paucity of detail, it may not be easy to trace the route to be followed on the southward way. To be concise, it lies from Havre up the Seine past Paris as far as Montereau, up the Yonne as far as Laroche, along the Canal de Bourgogne to St. Jean de Losne, thence down the Saône and Rhone to the Mediterranean. The mileage is apportioned between the various sections of the route approximately as follows:

Havre to Paris . . .	232·8 miles
Paris to Montereau . . .	60·8 ,,
Montereau to Laroche . .	52·7 ,,
Laroche to St. Jean de Losne .	152·2 ,,
St. Jean de Losne to Lyons .	131·0 ,,
Lyons to the Sea . . .	208·0 ,,
	837·5 ,,

The maximum draught for a boat to be sailed along this waterway is 4½ ft. The minimum depth of the various sections is Havre to Paris 10½ ft., Paris to Montereau 6¾ ft., Montereau to Laroche 6¾ ft.; Laroche to St. Jean de Losne 5 ft. 9 ins.; St. Jean to Lyons 6¾ ft. So much for the canals and canalised rivers; but the Rhone rushes south unregulated by locks and untrammelled by any impediments of man's making. The depth of water is therefore very variable, but as steamers frequently heavily laden ascend and descend below Lyons, any boat not exceeding the minimum draught just given should be able to get down.

The Rhone's irregularities are to some extent compensated for by the absence of locks which are unpleasantly numerous on some portions of the route. Indeed by the time the cruiser reaches Lyons he will have passed through no fewer than 233 of these necessary evils. But of these as many as 189 belong to the Canal de Bourgogne, the others being distributed as follows: lower Seine, 8; upper Seine, 12; Yonne, 15; Saône, 9. The locks are large and easily worked. The smallest measures 125 by 18 ft.

The scenery throughout the whole journey is never less than interesting; in many places it is beautiful. And the first two hundred miles from Havre to Paris is among the very finest portions of the route, though this, I fear, will not be thought by all who go up the Seine in midwinter. Yet those most deeply read in the lore of the older, wilder, most mediæval Normandy may find the country now as they have involuntarily pictured it: dark, sombre, lit-up by red sunsets, a fitting scene for the deeds of Rollo and Robert le Diable. At such times Rouen looks most like herself, and the tall towers of Jumièges, topping the leafless trees, strike eerily and mystically on the beholder. As far as Elbœuf the Seine is tidal and estuarial in character, navigated by sea-going ships and demanding of the crews of small craft constant vigilance and a good look-out. But pilots are to be had, and tugs, and thus even the least venturesome can reckon on getting up to the first lock at St. Aubin. Thence onwards to the capital the scenery becomes softer and more pastoral. We pass the feudal castles of Laroche Guyon and Chateau Gaillard, glance at the Côte des Amants with its romantic legend, pass a night perhaps at Mantes and endeavour to recall all that we ever learned of the Conqueror and the hot ashes. Close by is Triel, to which a visit must be paid for a sight of Poussin's *Adoration of the Magi*. Further up is Poissy, where St. Louis was born, and beyond it the ruined pile of Conflans, marking the junction of the Seine and Oise. Beneath the trees of St. Germain, past many a pleasant suburban resort, Mont Valerien keeping within sight all the while—now before, now behind, as the stream incessantly doubles and turns—past boathouses and rowing clubs, we follow the river, till we stop alongside the quays of Paris.

The upper reaches of the Seine are sylvan and placid, not unlike the upper portion of our own favourite river. One bank is occupied by the skirts of the forest of Fontainebleau, so you may be sure of pretty views in one direction. The town and palace of Fontainebleau are within walking distance of the lock of Samois, and would hardly be neglected by any but the most hurried cruisers.

And so we come to the bridge of Montereau, stained with the blood of John the Fearless, and enter on the third stage of our journey south. The Yonne is a stream as little known to English folk as the Tocantins or Hiddekel.

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It washes the quays of one of the most ancient and interesting cities of all France. Sens, Gallo-Roman, ecclesiastical, mediæval, has much to show that attests its former dignity. Above it towers the rude fortress-like cathedral, built in 1124 by the architect of our own Canterbury and believed to be the earliest specimen extant of the ogival style. Other churches there are in Sens of almost equal interest, and two other ecclesiastical buildings, the Officialité and Archevêché, ranking as historical monuments.

Laroche is a station well known to all travellers to and from the south, and here we enter the Canal de Bourgogne, with its 189 locks. Now we are well in the heart of France, in one of her three great wine-producing districts. The country with its vineyards and forests clothing its slopes, must be relied on to beguile the way, for the canal does not pass many places of pre-eminent interest. At Tonnerre we are again on the P. L. M. main-line; and further on we come to Ancy-le-Franc, where Primaticcio's palace still apes the splendours of Fontainebleau. And a few miles to the west of the canal is beautiful Semur, most picturesque of all French cities—worth a visit if only for the exquisite prospect from its terraces. At Pouilly we plunge into darkness, "black as Egypt's night;" the canal traverses the watershed between the Seine and Rhone by a tunnel two miles long. Emerging we find ourselves at the very foot of the "Golden Slope," and come presently to Dijon, the old capital of Burgundy. Here we are in a flourishing prosperous town, expanding in all directions, and strangling with its young and vigorous growth the old city which may still be traced here and there within it. The Palais des Ducs remains, with the tombs of Philippe le Hardi and his successors in the Salle des Gardes; likewise the Burgundian parliament-house, now the courts of justice. A cathedral there is of course, and many another church of the kind to be expected in a town of such renown. From Dijon it is 18½ miles by canal to St. Jean de Losne.

The Saône is a well-regulated and serviceable river flowing through fertile plains, with a current slow compared with that of the Rhone. Navigation is at times impeded by fogs. Chalon, 43 miles below St. Jean, is the most important place in the valley. It is thriving and active, doing better than Mâcon, which sits idly and sleepily beside the broad and misty river, enjoying magnificent views of the Alps and Jura. Here Lamartine was born, a fact of which the town is laudably proud. From Trevoux ("three ways") to Lyons, the Saône runs between rocky heights through breaks in which one can every now and then obtain glimpses of the mountains. From St. Jean to Lyons by water it is 124 miles.

The Rhone runs a rapid and almost rectilinear course southwards to the sea. Numerous small towns and villages line its banks, few of them of great historical interest. Vienne has a Roman temple dedicated to Augustus and Livia; Valence boasts its memories of Napoleon; Montelimar is of importance. Nature in this part of France exhibits a sublime and striking contrast. On one side are the cold, glacial Alps, on the other the scorched dry mountains of volcanic formation. The swiftly flowing river divides the regions of snow and fire. The sky is an intense blue; the brilliant sunshine and the sharp touch of the mistral remind us that we are in Provence. Sure enough here is the famous bridge of Avignon, 155 miles from Lyons. This is in truth the south, the south of Petrarch, of the troubadours of old-time song and minstrelsy. We pass Tarascon, Beaucaire, Arles—each with its souvenirs and savour of romance. The last stage of the long journey is through strange un-European country. Sky-rimmed plains stretch on either hand, their uniformity but slightly relieved by the thin lines of the irrigation-canal and the tall hedges of the plantations. Here and there long dark shadows are cast over the sunlit expanse by pyramid-like cypresses, poplars, and pines. Over the plains of the Camargue roam herds of buffaloes—those which make the Provencals' holiday in the arenas of Arles and Nimes. A choice of waterways is before the voyager. He can follow the canal which leads to dead Aigues Mortes, or on to bustling Cette; or follow the most direct route, past St. Louis Port de Rhone, and out across the blue waters of the Lion's Gulf into the teeming harbours of Marseilles.

Here you have a bird's-eye view of the overland route by water to the South—hardly graphic enough, I fear, to give you an adequate idea of its infinite charm, variety, and novelty. For those who may think it worth following, a word of practical information. Travel on the waterways of the Republic is free of any dues or tolls, but a permit must be obtained beforehand from the Minister of Public Works in Paris. Applications must set forth not only the name, dimensions, and description of the craft, but also the exact itinerary to be followed, from which no deviation will be allowed.

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THE MASTER SCULPTOR OF THE AGE

HOW AUGUSTE RODIN HAS RISEN TO HIS PROUD POSITION—ROMANCE AND HARDSHIP IN THE STREETS OF PARIS—"NOTHING HAS DAUNTED HIM: HE ONLY LAUGHS"—HIS HOME LIFE—WHAT HE CARRIES IN HIS POCKET—A VISIT TO THE STUDIO AT MEUDON

BY

W. B. NORTHROP

MUCH as the world rings with the praises of Auguste Rodin, whom some term the greatest living sculptor, comparatively little is known of his personal life. There are chapters in the history of this strange man which have been sealed even to his most intimate friends.

In fact, up to within a few years ago, Rodin lived a life almost wholly to himself. For years he remained "undiscovered"; and, after he became known, and had won victory after victory in every art exhibit in France, his own story was as much an enigma as ever.

To-day, though Rodin is sought after by many of the most distinguished people in the world, he is so absorbed in his work that he seldom permits himself to listen to the voice of the syren which tries to lure him into the social "swim."

Rodin's life started from the humblest of beginnings. Very little is known of his parents. Indeed, previous to his sixteenth year practically nothing is known of them or him. At that age he was running about the streets of Paris uncared-for and unkempt—a child of the streets—depending for his livelihood (such as it was) on the charity of the passing stranger. What he suffered in these days he has never told.

The mind of the boy Rodin was extremely active, and he eagerly acquired a taste for art. In what is reputed to be the most beautiful city in the world, he could not but imbibe some of the artistic feeling of his environment. He haunted the studios of the "Quartier Latin" and was early employed in running errands and doing other useful works for some of the artists who took a passing interest in the boy in order to "keep him off the streets."

Legend has it that one of the first persons to render any assistance to the artist was a sculptor who employed him to mix clay in his studio. Like the childhood of the great Murillo, Rodin's days were spent in looking upon work in which he himself dared not take a part.

There were times, however, when even the boy had his moments of gratification. Clandestinely he used to model in clay during the absence of his artist employer; and, though he attracted little attention, he still acquired the rudiments of an artistic education.

Through some circumstance or other—which has never come to light—Rodin lost his first position with a certain sculptor, and found himself, after a year's work in the studio, again on the Paris streets. He was now in his seventeenth year. But the divine inspiration had seized him. He was no longer satisfied to remain like the other street urchins with whom he temporarily associated. He resolved to be among them, but not of them. They were to serve his purpose in life; not to share his ambition. In his heart—boyish though it was—he had resolved to become the foremost sculptor of the day.

Every morning Rodin persuaded one or other of his street companions to pose for him while he modelled them in clay. It was not the fine clay such as he had found in the studio of his sculptor friend and former employer; but he had to content himself with modelling from the common mud of the streets. In the great public parks of Paris, and in out-of-the-way courts and empty yards he managed to obtain certain grades of clay which answered his purposes; and many a little figure he modelled direct from life, and out of the handiest material close by.

After some years of silent and well-nigh heart-breaking work, young Rodin resolved to try to become a permanent member of some French art school where he could obtain every facility for carrying on his work. Certain materials were essential to him. He had

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reached the stage in his art career where the evanescent material of the street—out of which the water dried so quickly that none of it would retain the form he had given it—would no longer serve him.

In his nineteenth year, he made a model in clay of one of his street companions. It was a crude piece of work, to be sure; but, with it, he hoped to win entrance to the Academy of Fine Arts. Each year in this institution an examination "for all comers" is held; irrespective of whether they have been previously schooled or not.

For many weary nights and days Rodin worked at his model, and finally, considering it complete, sent it in. He did not have long to wait for his answer. In a few days he received notification to come and take his work away. In the most cruel of terms, he was informed "Your work does not exhibit any evidence of talent."

Undaunted, however, by the blow, Rodin resolved to struggle on towards his ideal. He worked silently and incessantly. For many months he lived in one of the most miserable quarters of Paris, associating among the very poorest. He had neither the means to pay for art material, nor the influence to obtain any on credit. Every public examination that was held found Rodin an exhibitor; but always with some discouraging result. Everything he did was rejected.

It is said that at this time—in these darkest days—many opportunities presented themselves for Rodin engaging in work separate from art which would undoubtedly pay him well. But he scorned all these opportunities, consoling himself with the idea that, if he persisted through everything, fame would finally attend him. "Scorning the promise of the real," he sought to work out his salvation along purely artistic lines.

In 1862, when in his twenty-second year, Rodin managed to attract the notice of the best-known sculptor of his day, Barye. The great sculptor took much interest in Rodin, and placed at his disposal all the art material he needed. Rodin was not long in taking advantage of the splendid opportunity. In his first year with Barye, he produced a vast quantity of work; mostly, however, in finishing the works of his employer. Barye found him industrious and determined. In the following year the opportunity came for Rodin to show what was in him. In a piece of sculpture called the *Man with the broken nose* he displayed wonderful anatomical skill. All the artistic life of Paris was soon discussing the work. Rodin awoke to find himself famous.

From that day to the present, his progress has been almost triumphal. It has not been, however, without its bitter experiences. Rodin has twice been commissioned by the French Government to do public work—once to make the statue of Victor Hugo; and more recently that of Balzac. In both of these works he has met with disappointment; both were rejected on completion. But nothing has daunted him. He only laughs. Conscious of his own power, he works regardless of the world's opinion. Assailed at one time on every hand with storms of criticism, called impostor, degenerate, sensualist, and every other opprobrious term that the artistic temperament can be visited with, he has come out an acknowledged master.

His home life itself is a triumph over his enemies. On one of the hills overlooking the pretty village of Meudon—about half an hour's ride westward from Paris—Rodin has taken up his abode. A few feet away from his rather plain house he has erected a truly beautiful studio. It is octagonal in shape and is practically a palace of glass; for the four walls are nothing but windows. Here Rodin works almost incessantly.

Few artists have lived so much in their work as Rodin. He rises early—about 6 A.M.—and, after a light breakfast, immediately starts work. It might be said that even before this his labours begin; for at the breakfast table he usually has some statue or other on which he is working. Placed on the table before him he often has some piece of antique sculpture which, even while eating, he contemplates. The verandah of his house has been covered in with glass in the form of a species of conservatory, and in the place ordinarily occupied by flowers are pieces of ancient sculpture.

One of Rodin's most treasured pieces of ancient art is a small wooden pigeon. This he admires immensely; and he has even been known to take it to bed with him.

Always in Rodin's pocket one will find a piece of modelling of some kind: a small head; a small hand; a leg; an arm; part of a trunk. He studies these things on the train, in the restaurants. Even at dinner parties, when conversation has tired him, he has been seen to take out one of his "little pieces" as he calls them, and study it secretly.

Rodin claims that "originality" has been

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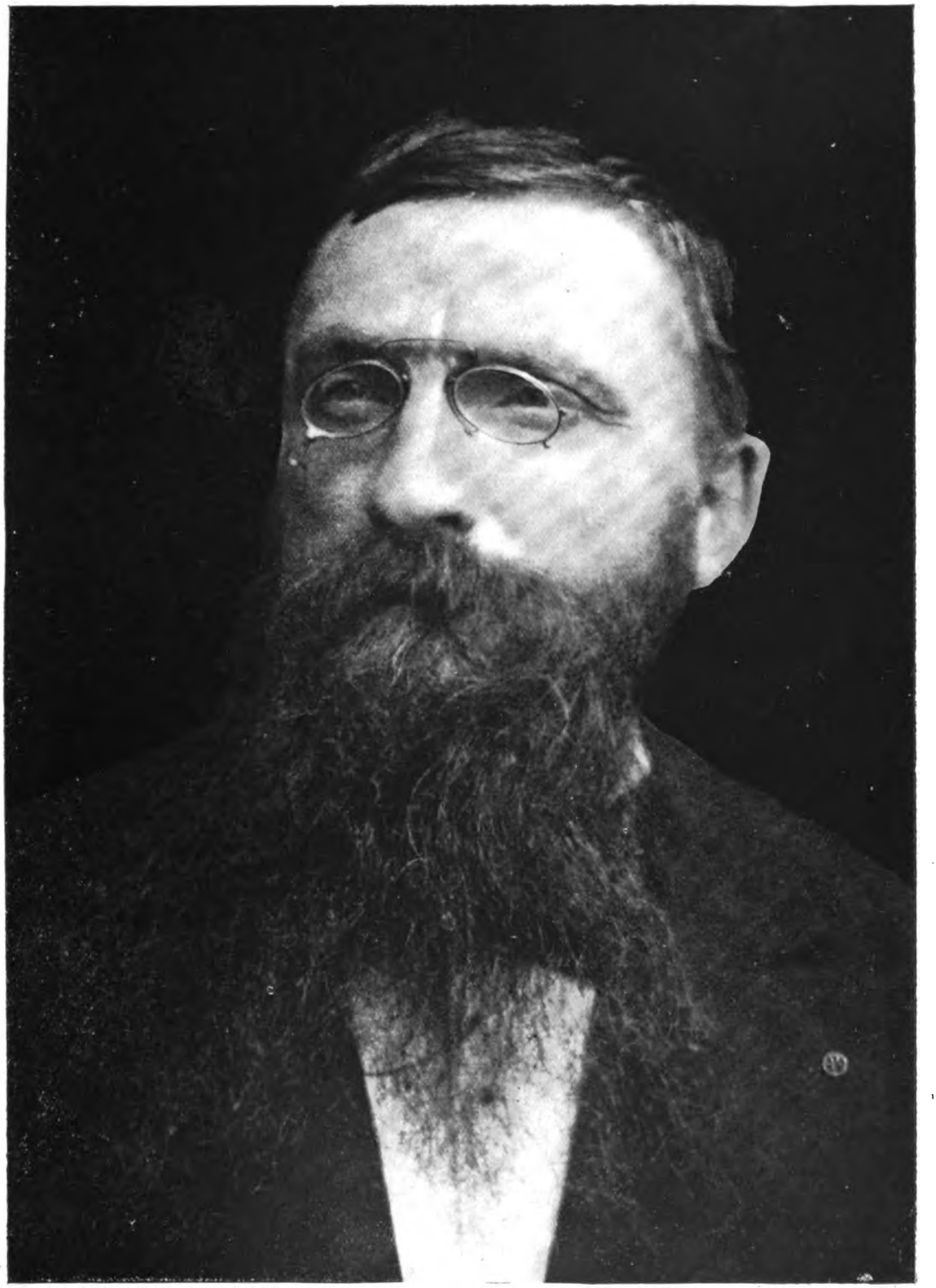

M. AUGUSTE RODIN

WHOSE ROMANTIC RISE TO FAME IS DESCRIBED IN THIS ARTICLE

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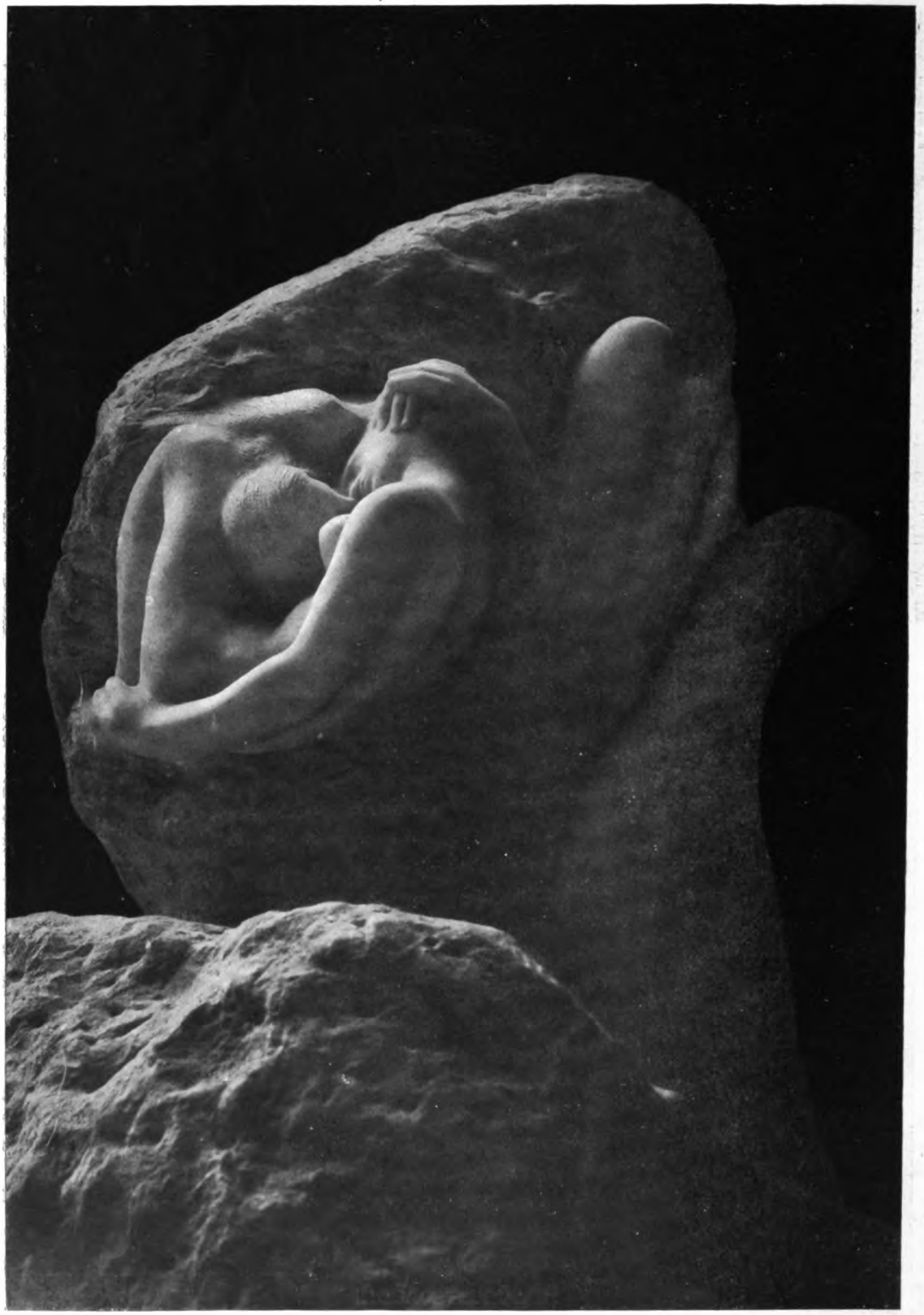

RODIN'S MASTERPIECE—"THE HAND OF GOD"

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M. RODIN AT HOME

the bane of the artist. He says that it is only when artists depart from themselves and appeal solely to nature that they are great. The so-called originality of the day is, he says, merely to hide the fact that the artist has been unable to follow carefully the copy nature has laid down for him.

Rodin's studio at Meudon is truly remarkable. Besides containing many pieces of great sculpture, there are hundreds of tiny little figures, and fragments of human and animal anatomy. They are ranged in glass cases, and seem to be numberless. Every form of muscular contraction has been shown. It is true that many of Rodin's figures have been criticised as obscene and lewd in design—but he excuses all on the ground of "Nature."

"You see all these things in nature," says Rodin by way of answer, not apology, to his critics, "and whatever is shown by nature is justified by art." On these lines he works. Some of his conceptions are truly wonderful. Perhaps the most marvellous of all is what he has called *The Hand of God*. A few words describing this might not be out of place. In a block of marble perhaps a yard square Rodin has expressed the whole of life: all that came before and all that will follow existence. A giant hand, free from the wrist, rises from the stone. The firm repose of the muscles suggests a power invincible, irresistible, and supremely calm. A nebulous mass rests in the upraised fingers, held gently, yet so fast that the lever which could have raised the world would break vainly here. Curled in the cloud are two human beings—a man and a woman, entwined in each other's arms, clasped in each other's embrace, lost in a dream of joy, unconscious, uncaring. What matters to these if to-morrow they are not? To-day, they are; they live; they love.

At Meudon, his country home, Rodin lives the life almost of a recluse. Here Madame Rodin waits assiduously upon him, and sees that he has every comfort while carrying out his great ideas. In connection with his house, Rodin has a really fine—but very untidy—picture gallery. Here are seen some of the finest paintings. Many of these are still unhung. Among other works of art of which he is more or less proud is a splendid painting of Rodin himself by Sargent.

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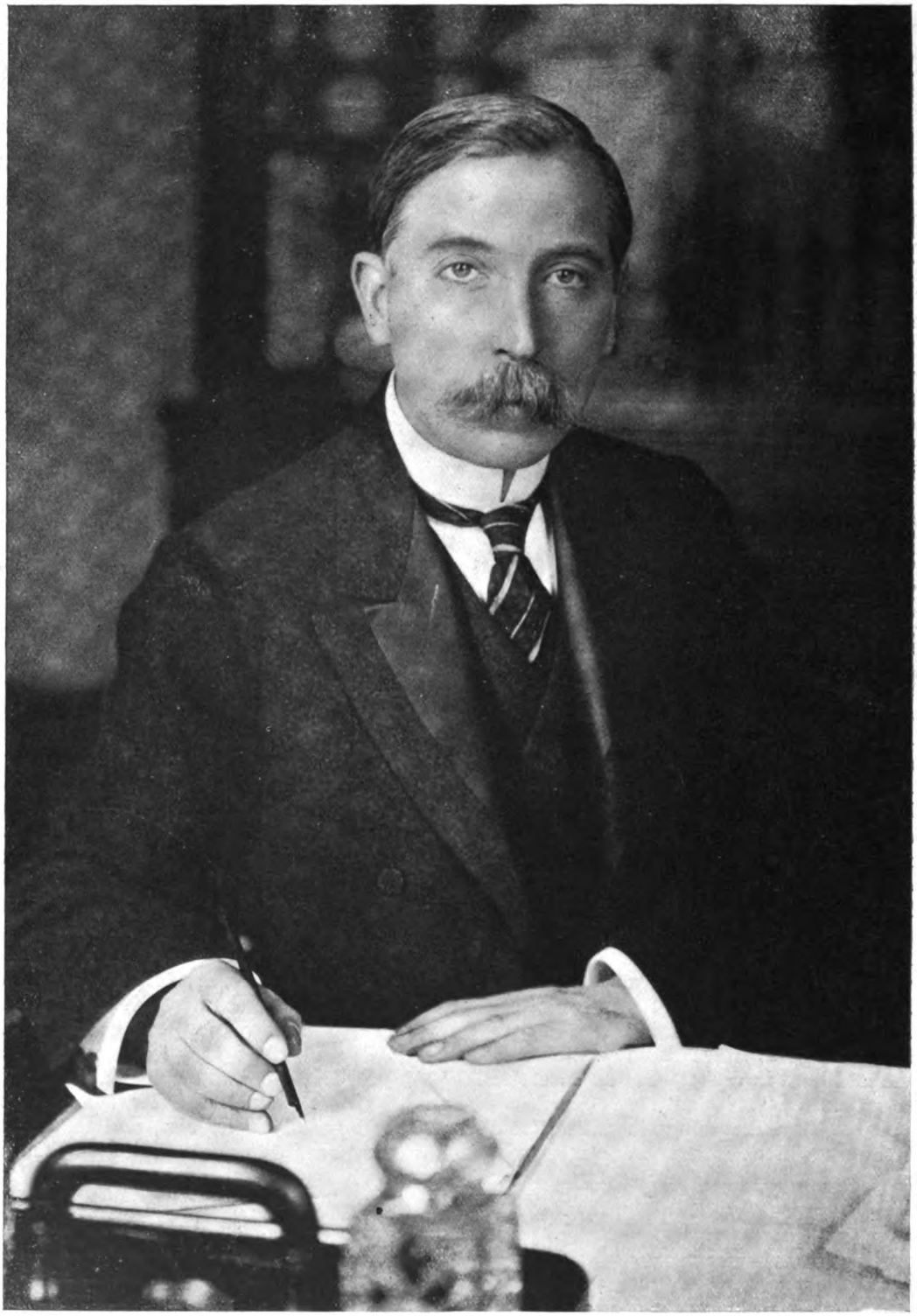

Moyse

MR. EDWIN A. CORNWALL, J.P.

CHAIRMAN OF THE LONDON COUNTY COUNCIL

A photograph taken at the County Hall and now published for the first time

[See page 603

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NATIVE WOMEN MAKING TAPPA CLOTH IN RARATONGA

AN ISLAND PARADISE OF THE SOUTH SEAS

RARATONGA, A FAVOURED SPOT WITH A MONTHLY MAIL AND NO REGARD FOR TIME—ITS INHABITANTS—FRUIT AND COPRA EXPORTING—ROOM FOR MORE EUROPEANS—COLONEL GUDGEON'S GOOD ADMINISTRATION

BY

BEATRICE GRIMSHAW

THE rain is thrashing the muddy street outside; the gas is lit. Windows are tightly latched, and doors are guarded by sand-bags at the sill. There is a faint smell of damp woollen stuff, and a stronger odour compounded of upholstery, gas, and re-breathed air. Some weather-beaten roses, and a dish of strawberries, purple and pulpy with wet, stand on the sideboard, representing the season's gifts. It is an English summer evening.

* * * * *

In the South Sea islands it is winter now. The stephanotis is out of flower on the broad verandah, but the gardenias lift sweet wax-white faces from their tall dark bushes on the lawn, filling the air with their heady and dreamy scent. The great white-and-gold stars of the frangipanni-tree, dropping from above on the verandah flooring, are almost too sweet; one would rather smell the delicate bells of the climbing yellow trumpet-flowers that screen our low hammock chairs from the westering sun. The oranges are nearly over, a few golden

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A PICNIC BY THE SEA

balls still hang on the trees, or roll about on the trimly shaven lawn; but the flying-foxes have sucked most of them, and we must go to our pine-apple patch, or our banana grove, or pick a big granadilla, full of acid-sweet pulp, from the vine on the cook-house roof, if we want a bite of fruit. The mango-trees are not bearing now; the soursops, however, are ripe, and the cocoa-nuts never fail, though the bread-fruit is all done. As for the great floury roots of the island, the taro, kumara, ti, and yam, they go on for ever.

Where are we? How is one to find the scene of this strange winter's day upon the map of the world? One must take the Western Hemisphere, find New Zealand, and look in the great Pacific Ocean, sixteen hundred miles N.E. of Auckland, for the Cook Islands—a group of mere fly-specks upon the immense blue map. One of these specks, and not the largest, is Raratonga, principal island of the group. It is but twenty miles round; and Avarna, its capital, and the seat of government for the whole group, is only a village with one street of one side. Raratonga is a "high island," being volcanic as well as coralline in formation, and therefore extremely rich and fertile. Gliding up from sea to the wharf in one of the white-winged, white-hulled island schooners that flit like ocean butterflies about the group, one sees first of all the barrier-reef—a line of tumbling surf that cuts off the blue, burning sea from the vivid malachite green of the lagoon. Then comes the beach, a strip of coral-sand as white as linen, wreathed here and there with trailing, yellow-flowered vines, and creeping pink or white convolvulus. Beyond is the road with its scattered houses; some built of little poles like pea-sticks, that let in air and light, and thatched with plaited pandanus leaf; some (the houses of white residents) walled with shingle or stone, and iron-roofed. All have deep shady verandahs and most are gay with island flowers. Behind these, again, rises a rampart of feathery cocoa-nut trees, flanking the green forest or bush. Above and beyond all springs into heaven the splendid spear of purple Ikwrangi, a huge pointed crag some 2000 ft. high. Other hills, higher but farther away, stand about the harbour in a circling amphi-theatre of exquisite loveliness—violet and green and richest blue sharply serrated in dark lance-heads against the brilliant sky, and broken into dizzy precipices of rude grey rock, veiled by dropping falls of flowery green. In all the beautiful South Seas, from dreamy Honolulu to rich Samoa, and south-ward to the lonely Australs, Rapa and the fer-tile Kermadecs, there is nothing fairer, nothing that holds the heart more closely than little, lovely Raratonga.

Seventy or eighty white people, and about two thousand natives, live in the island. Raratonga is one of the favoured spots that touch the fortunate mean between the over-civilised elegancies of Hawaii, and the actual hardships endured by all who live in isolated and unvisited groups. A monthly steamer, running from Auckland to Tahiti, calls at Avarna on its way, bringing mails and news-papers from the outer world and carrying island produce—fruit copra (dried cocoa-nut) and lime juice—back to the markets of New Zealand. In all Pacific islands which enjoy a regular mail service, "Steamer Day" is the great event of the month, week, or fortnight. At Raratonga when the tiny trail of smoke first rises out of the empty sea (it may be on the day expected, or it may be later—there is little time in the Great South Seas) the whole island is agape with excitement. The natives shriek with delight, and deck their hair with

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wreaths of flowers; the white people put on spotless duck suits and clean muslins, and hover about the wharf like excited butterflies. The great whale boats are ready to rush out at racing speed to the steamer, long before she has come to a stop in the Bay (she dares not come into the harbour, which is only fit for small schooners). Passengers from Auckland come ashore with the first boat, and find themselves the object of rather more interest than a circus procession would arouse in centres of civilisation. The whole population flings itself in one seething breaker against the doors of the post office, while the mails are being sorted, and bursts in like a besieging army as soon as the bolts are withdrawn. But no one can wait to open letters and papers, to hear about the war between Russia and Japan, and other burning questions of the hour. Purser, passengers, and even stray sailors are seized on, and compelled to "stand and deliver" news upon the spot. The mind being satisfied, the body asserts its claims. There is no beef in Raratonga, only mutton, and very little of that; the "trail of the tin" too often deforms the happy domestic board. Once a month, however, the steamer brings fresh beef for every one, "lashin's and lavin's" of it, in her refrigerator. For two brief days thereafter Raratonga feasts royally. About noon on steamer day, a savoury smell diffuses itself throughout the capital; every one is asking every one else to dinner and lunch, with true island hospitality, so that Mrs. A and family may have a taste of Mr. B's sirloin, and Mr. B get a bit of the C's steak, and the A's and B's enjoy a little of Captain D's roast ribs. There is an unctuous happiness about every face, and white dinner-coats at dusk flit up and down the perfumed orange avenues as thick as night-moths.

Once the steamer has come and gone, a dreamy peace settles down upon the little island. There is seldom much certainty as to exact time by the clock, since every one has a different hour; and the day of the month is little heeded. This pleasant disregard of Father Time is the true secret of the fascination of the South Sea islands—or perhaps one of the secrets, since no one has ever really succeeded in defining the unspeakable charm possessed by these lotus-eating lands. Imagine a civilised country, where people dine out in evening-dress, leave cards and have "At Home" days, possessed of only one post a month, no telegrams, no trains, or trams! Imagine the

UNDER THE MAUPEI TREE—THE CHESTNUT OF THE PACIFIC

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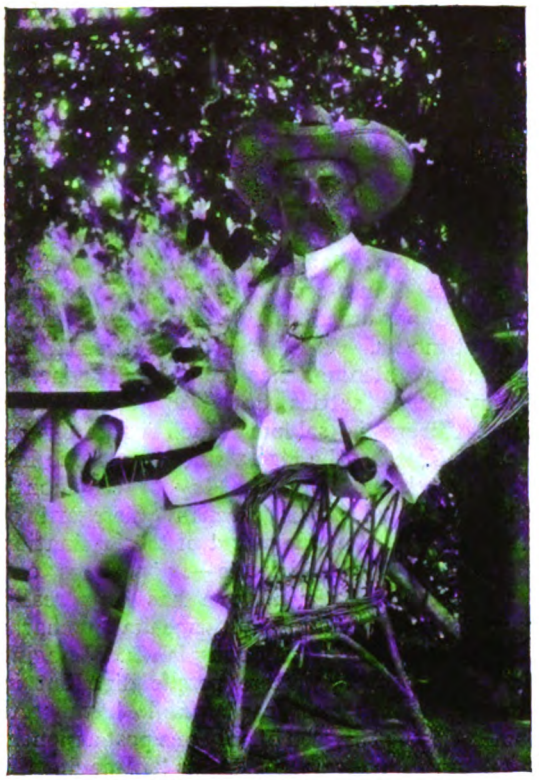

COLONEL GUDGEON
Resident Commissioner at Raratonga

peace that comes of knowing that, for four whole weeks after the steamer goes away, there can be no disturbance in the even current of life; no great events at home or abroad; no hurry, no worry, no responsibility! People keep young long in Raratonga; smiles are every-day and all-morning wear. Nobody is rich—rich men don't come down to the islands to keep trading stores, or take up small government appointments—but every one has enough and extravagance is impossible, since luxuries are unpurchasable on the island. There are no social distinctions save that between the white race and the brown; all the white residents know each other on a common footing of equality, although in England, or New Zealand, they would probably be split up into half a score of mutually contemptuous sets.

As for the natives—the jolly, laughing, childish, brown-skinned men and women of the island—their life is one of peace and plenty in the highest degree. There were at least six thousand of them in old times; now there are but nineteen hundred, for depopulation, the curse of Polynesia, lies heavy on the Cook Islands. As a result, every native has rather more land than he wants, and bread-fruit, yams, taro, bananas, oranges grow either without cultivation, or with very little. A native house can be put up in a day or two; furniture is superfluous, and clothes consist of a few yards of cotton print. The Raratongan, therefore, owes no debt to society for his mere existence in quiet comfort, if he does not choose to work. But in most cases he does do something, for he wants a buggy and horse, a bicycle, a sewing-machine for his wife, ostrich feathers for his daughters, shoes with squeaking soles for festive wear, bottles of coarse strong scent, and perhaps even a concrete-built house with an iron roof, which he really likes much less than the open-walled cottage typical of the country, although the concrete house is considered stylish and smart, and arouses envy among the neighbours.

In order to secure all these good things, the Raratongan cuts up and drys a few thousand cocoa-nuts for copra, or nails up some scores of banana bunches and hundreds of oranges, in wooden cases, to send down to Auckland. For this he gathers in good British gold by the handful. Copra brings him £7 a ton

AN ISLAND LILY

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in Raratonga, and two thousand nuts will make that amount. Other produce is hardly less profitable. There is little work, and hardly any risk; so that the native of Raratonga can (and does) spend the greater part of his time singing in choruses on the long shady verandahs of the various houses, dancing to the music of a drum under the cocoa-nut trees, or fishing lazily off the reef.

The profits of fruit and copra exporting have attracted a few white planters to the island, and some of the superfluous native lands are gradually being taken up. There is room for a few more active, steady Europeans in this business, which (unlike most colonial planting) does not demand any special knowledge, being extremely simple and easy. Good land can be had on ninety-nine years' leases at about 5*s.* an acre. The cost of clearing and planting with cocoa-nuts is about £5 an acre. The palm does not bear for about eight years, but in about nine years' time every acre brings in at least £5 net profit per annum for eighty or ninety years to come; so that a small plantation of a hundred acres would bring a steady income of £500 a year to the planter himself, his children and his grandchildren. Certainly not a bad return for the original £500 spent in clearing, and the rent of about £25. All running expenses during the years of waiting can be covered by planting bananas among the cocoa-nuts; these bear at fifteen months, and are very profitable as a rule. The Cook Islands are free from destructive hurricanes, and the climate allows any healthy European to work out of doors at any time of the year.

This matter of climate, indeed, deserves more than a passing reference. Most people who live in the temperate zones suppose that all the tropics are regions of unbearable heat. This is not the case, however, with most of the South Sea islands, where the heat of tropical latitudes is pleasantly tempered by ocean surroundings. Raratonga is specially favoured in this matter. The three months of genuine summer—January, February, and March—are certainly hot, wet, and steamy, but the thermometer rarely reaches ninety even then. There are a couple of indeterminate months on either side; and the remaining seven are delightful—bright and pleasantly warm during the day, and so cool at night as to require the use of blankets. The air is clear and invigorating, mosquitoes almost cease from troubling, and it is a pleasure merely to be alive. There are no fevers of any kind in the island, or any indigenous diseases; indeed the office of the resident doctor, paid by the New Zealand Government, is very much of a sinecure.

Picnics, and drives round the island, are the great diversion of Raratonga. There is only one road, which encircles the whole island; the surface is very fair, and a light buggy with a native horse can get round it in about two hours and a half. The distance is just twenty miles. The scenery all through is exquisitely lovely—on one hand, the mountains, opening out continually into splendid vistas of river and valley, deep gorge and lofty crown; on the other, half hidden by a veil of delicate, drooping ironwood boughs, the snow-white coral beach, the green lagoon, and the blue, untroubled, empty sea. The sound of the foaming barrier reef never ceases day and night, through every corner of the island its magic song chants softly in the warm, languid air. There is a wonderful spell in this surf song of the Pacific, so unlike the sound of any seas that beat upon our chilly northern shores. Once having listened to it, the voyager from other lands can never be the same again. Going away, he will promise himself to return again and stay longer; and if the twin lions of Duty and Poverty do not stand in the way, return he will—perhaps for ever. If, on the other hand, the purple peaks and moving palm-trees never lift again for him, the magic song will haunt him, longing, regretful, and infinitely sweet, through all his after life. On dim, misty evenings, when the pallid moon of England skies looks down through falling leaves and flying rain, he will see the still, violet dusk of the South Sea midnight, laced with rays of molten silver that light up the very palms along the beaches in clear soft shades of green, and show the rich clusters of orange blossoms, gleaming like fallen stars among their tangled boughs. Sleeping in the roar of the unresting city, he will dream of the soft rustle of "maupei" leaves, in some untrodden, silent, star-roofed palace of the island forests. Walking by the grey angry Channel seas, he will remember the gleam of the blue changeless ocean beyond the emerald lagoon, and hear, more clearly than ever, the sleepy crooning of the coral reef, calling him whither he may not come again. . . . Regret, long-lasting and deep, is the fruit that most island travellers gather from feathery palm and spreading forest tree.

The drive round Raratonga leads, at intervals, through beautiful groves of ironwood or "toa," a tree that is equally valuable and lovely.

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Its tall, massive, red trunk and boughs are composed of a wood so heavy that it sinks like metal in water. Weapons of war were formerly made of this tree. Now, it is mostly used for building, bridge work, and wharves. The foliage is almost exactly like asparagus fern, and stands out most effectively among the heavy splendid leaves of the "ootoo," or *Barringtonia Speciosa*, a magnificent monster with great pink feathery flowers and polished oval leaves a foot long. Among the many fine trees of the island, however, the maupei, or Pacific chestnut, is easily queen. This splendid tree sometimes rises to a height of over a hundred feet. It has an enormous trunk, ridged and buttressed with perpendicular supports, and frequently hollowed out into caverns of quite habitable size. It grows very freely all over the island, and furnishes one of the most important items of native food, in the form of thousands of huge, flat, floury chestnuts, very nourishing and palatable.

The hibiscus is, perhaps, from a scenic point of view, the chief glory of the islands. It grows to fifteen or twenty feet in height, and is covered, year in and year out, with a mass of gorgeous crimson flowers. The single variety carries great pinky-red bells, with a dark central eye; the double kind shows big balls of crumpled scarlet petals. The tree grows everywhere very freely, and is much used by the natives for decoration—a flower behind each ear, a circular crown of blossoms, or even a closely woven cap of the flowers of the double variety, being often worn. There are also yellow, white, and pink varieties of hibiscus.

Raratonga is a part of Greater Britain, having been annexed in 1902 to the Government of New Zealand, together with a large number of other islands in the same part of the Pacific. The local government of all these is under the charge of Colonel Gudgeon, the Resident Commissioner of Raratonga. Colonel Gudgeon is an interesting and remarkable character. He is perhaps the best authority living on ancient and modern Maori customs, beliefs, and traditions, and has written much about these subjects. Twenty years of his life were spent among the Maoris of New Zealand, as an officer of various native regiments, and he was more than once promoted by the Government authorities for acts of the most daring and reckless valour. Under his administration, the Cook Islands are doing well and coming forward; life and property are absolutely safe, trade increasing, and the old objectionable "beach-comber" element swept away. The Cook Islands, under the present *régime*, are no place for the young gentleman who has "done something," and wants to get away from his acquaintances; for the older individual who has never done anything good or bad, and does not mean to, as long as he can owe or borrow instead; or for the man who regards the islands as a suitable place to make an absolute brute of himself, free from all civilised restraints. The respectable European, married or single, with some capital and plenty of industry, is the type that the Cook Islands want, and they will probably not be long in obtaining their desire.

Meanwhile, life "under the maupei tree" goes on pleasantly and smoothly, unvexed by the tumults and worries of the outer world. There is, perhaps, no spot on all the earth happier or more peaceful than these

> "Summer isles of Eden lying
> In dark purple spheres of sea."

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THE CHAIRMAN OF THE L.C.C.

THE GREATEST MUNICIPAL POST IN THE WORLD—WHAT IT MEANS—THE MAGNITUDE OF THE LONDON COUNTY COUNCIL'S WORK—MR. CORNWALL'S CONCEPTION OF HIS OFFICE

BY

GEORGE TURNBULL

TALENT and honourable service are chiefly the things that raise a man to the position of Chairman of the London County Council. They are richly combined in the person of the present occupant of this great honorary post, Mr. Edwin A. Cornwall, J.P. On the County Council itself he has shared with other members "the daily round, the common task" for thirteen years, and before the days of the Council he was already a force in municipal life. Upon public questions from the first he has brought to bear the same energy that characterised him as a business man, and with a similarly happy result.

Edwin Cornwall started work at an age which nowadays is thought too early for a boy to leave school. Before he was thirteen he had entered the office of a firm of coal merchants at Hammersmith. Four years passed, and the youth of seventeen was appointed by his employers a depot manager at Kensington. Four years more and he had begun a business of his own which to-day has branches in all parts of London, and has long been in so perfect a state of organisation as to allow him leisure to follow public work. To-day, though he is only just over forty, Mr. Cornwall has to his credit nearly twenty years' work for London. Living in Fulham in those early days, he took a keen interest in parochial affairs. He saw, as did many others gifted with less organising ability than he, how backward London was, and particularly the room for reform in the administration of his own district. An actively pursued idea to help purify it resulted in his election upon the Vestry. Here he became the leader of a party which took its name from his, and which is still remembered down there. The "Cornwallites" were a majority; they investigated abuses; dismissed incompetent officials; put to flight a large number of the old members of the Vestry; awakened an interest in local affairs hitherto unknown in Fulham; and brought new and purer ideals to the practical work of administration. Mr. Cornwall was elected overseer and chairman in turn, and his connection with Fulham was consummated when he received the compliment of being chosen in 1900 the first Mayor of the borough.

The London County Council was three years old when Mr. Cornwall joined it in 1892. He immediately became an important member of the Progressive party, and as chief whip for several years he had opportunities for displaying an amount of tact and generalship that gained for him the respect of both sides at Spring Gardens. As Chairman of the Parliamentary Committee, the General Purposes Committee, the Rivers Committee, Day Schools Committee Main Drainage Committee, as well as in other capacities in connection with the Council's manifold labours, he has always been a hard worker. The great Holborn and Strand improvement, which is to see its completion during his year of office, received its sanction when he was chairman of the Parliamentary Committee. And another reform for which he has toiled will see its accomplishment this summer when the splendid service of steamboats to be placed on the Thames will add enormously to the convenience and pleasure of the people.

Although Mr. Cornwall, with the above record of service behind him, would say that he is enjoying "a year off" while he is the Council's Chairman, it is more accurately described as a year of intensely hard work. He may be—he is—"off" in the party sense, because Mr. Cornwall is rigidly scrupulous in his view of the impartial character of the position; but the Chairman has a great deal to do. All the world knows that Lord Rosebery, during his chairmanship, stamped his individuality strongly upon the Council of that time. It is not so well known, but it is nevertheless just as true, that each

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succeeding chairman has brought into the work connected with the office his own personality and individuality. And as there have been thirteen chairmen during the life of the Council, this means that throughout there have always been freshness of ideas and vigour in the highest position of the Council.

Enter the County Hall, then, and see the Chairman at work. You encounter at the entrance a fact which is creditable to the thrift of the Council, but hardly creditable to London. One blushes inwardly as the idea of the side-door of a public-house inevitably rises to one's mind. The impression is odious. And it is quickly effaced—effaced by the air of alacrity that dwells inside the paltry doors. A knowledge of atmospheres of public departments in the capital of the Empire enables the visitor to decide that capacity of administration is nowhere suggested so much as it is by the atmosphere of Spring Gardens. No one is hanging around, no one is superfluous, no one is noisy. Every one has his work to do, and so far as you can see every one is doing it. Here Mr. Cornwall spends many hours almost every day. To carry out his multifarious duties, indeed, the chairman need almost live at the County Hall. Mr. Cornwall lives very near it. Even when away from it, he cannot free himself from County Council duties, but finds it necessary to be in constant communication with the offices by telephone. He has to watch the general proceedings of the Council and its committees, and he is *ex officio* a member of every committee and sub-committee of the Council. On an average there are fifty meetings a week of committees and sub-committees. Besides his purely official duties, the Chairman is obliged to devote much time to ceremonial functions. By virtue of his office he receives a very large number of invitations, and he is also required to take the chair at all the big public ceremonies with which the Council is concerned. Then, too, the number of foreign visitors who come to study the Council's work is considerable, and the Chairman receives them and arranges for their wants being satisfied. Much of his time every day is occupied in attending to correspondence and in granting interviews to members of the Council and others who require to see him on important matters, particularly the chief officials, who find it desirable to consult the Chairman.

The municipal government of London is so complex that Londoners themselves are often at a loss to understand where the duties of one body begin and those of another end. The simple explanation is that the City Corporation, the City of Westminster, and the Borough Councils respectively deal with the detail work which affect their particular districts only, while the London County Council deals with the affairs which are common to the whole of London. These are great and extensive and peculiar. From 1889, the year of the Council's birth, to 1904, the capital expenditure of the Council was about £24,000,000. Its gross debt outstanding on March 31, 1904, was £61,000,000; from this deduct assets amounting to £30,500,000, and there remains a liability of about £30,500,000.

There is much talk of "County Council extravagance." This is a question which affects Londoners, and which Londoners alone are able to judge. The County Council expenditure on services other than education costs less this year by ¾*d.* per £1; but when they hear of a project for a new County Hall on the south side of Westminster Bridge, which is estimated to cost £1,700,000, and of a tramway expenditure in the north of London of £4,500,000, the opponents of the Council raise an outcry. The sane point of view of Londoners is more likely to be that adopted by Mr. Cornwall:

"I am prepared to assert," he says, "that for any expenditure incurred by the Council full value has been given to the people of London. The work of the Council receives the hearty support of the people of London—and not only of the people of London, by the way, for we are receiving continual evidence of its interest to others in the Kingdom, and indeed throughout the world. I have great faith in the municipal instinct of the Londoner, and I believe the London County Council is destined to extend and develop in such a way that when it has had a little longer time to deal with the vast problems of London, it will become recognised as the leading municipality of the world. Some may say it has reached this summit already, but there remains so much for it to do that I only assert at present that it must assume this position at no distant date."

Five thousand acres of parks, gardens, and open spaces are the vivifying witnesses to the Council's care for the health and recreation of London's millions. In the same direction of promoting a better environment for the citizens lies its dealing with the housing question. The slums of London acquired and cleared by the Council mount up to forty acres. Schemes are in hand at the present moment for erecting new buildings upon this forty acres, and in clearing the ground nearly 17,000 persons of the labouring classes have been displaced. New buildings

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have been or are being provided for 43,000 persons. Then the Council has decided to develop certain estates whose area altogether is 320 acres, and to erect new dwellings to accommodate nearly 60,000 persons. These figures do not include 14,000 persons displaced by the carrying out of street improvements, for whom accommodation has been provided in new dwellings. At Tottenham the County Council have raised a new village at a cost of £1,000,000, with provision for 40,000 souls. The houses are not letting well. Critics naturally conclude that this tells against the Council. Yet the apologists for the Council are not straining a point but merely stating the sober truth when they say that it is unfair to expect the Council to compete against the speculative builder. The Council must act as a model for private enterprise.

"I do not for a moment," says Mr. Cornwall, "blame the man with 25s. a week and four or five children for going into a jerry-built house. If it is cheaper than a County Council dwelling; the man is not to be blamed for choosing it instead of the better house. But remember we have to fix a standard; the County Council is an example to private builders. The rents of our dwellings are not so low as I should like, but when one remembers how London house rents have gone up, one can see that dwellings erected by the municipality—whether Borough Council or London County Council—act as a rent-fixing standard. Supposing that forty years ago municipalities had done what we are doing now, and established workmen's dwellings in various parts, you may depend upon it that the rents of such dwellings would not have quadrupled, as the rents of London houses in the hands of private owners have done."

Here is an instance of the benefit accruing to the people by the County Council improvements. In 1903 the death-rate for the whole of London was 15.2 per 1000; in the Council's dwellings it was only 11.8 per 1000. It is an equally significant fact that while the Boundary Street area of Bethnal Green in 1899, before the Council cleared the area, had a death-rate of 40.13 per 1000, by 1903 the death-rate on the estate as laid out by the Council had fallen to 12.7. In the surrounding district of Bethnal Green the rate was as high as 18.2 per 1000.

The Council also studies the health of the people by its system of main drainage, under which it deals with the sewage, which, after precipitation treatment, is discharged into the North Sea. For this system there is needed a total length of sewers of 290 miles (this, of course, does not include local sewers), draining an area of about 140 square miles, whose population is over five millions.

Passing over the many duties of the Council under the Public Health Acts, Public Control Acts and Factory Acts, &c., we come to the extensive street improvements which also administer to the health of the people, by providing light and air in crowded districts and assisting locomotion. The Council has undertaken about sixty-five schemes for street improvement, consisting in the formation of new thoroughfares or the widening of existing main roads. Altogether these improvements affect twelve miles of London, and cost in gross £13,000,000, from which it is estimated that £6,000,000 will be recouped by disposal of the surplus land, leaving the net cost at £7,000,000. These are the schemes which cause the displacement of nearly 14,000 persons of the working class, for all of whom adequate accommodation is provided in new dwellings.

As the tramway authority for London, the County Council owns about 100 miles of tramways. On the south side of the Thames, where it is working nearly fifty miles, there were 133 million passengers carried over the lines in the year 1903, and a sum exceeding £500,000 was received in fares. Fifty million of these passengers were carried at half-penny fares and in swift electric cars. The life and property of the people are also carefully guarded by the Council in its administration of the Building Acts and Factory Acts, and of course it maintains the very popular Fire Brigade. In this matter alone the Council's responsibilities are unequalled by any other city in the world, as it necessitates the provision of more than 90 stations, 27,000 hydrants, 80 fire-engines, 100 hose carts, 67 horse escapes, 970 fire alarms, 300 horses and 1250 men. The licensing of theatres and music-halls also falls to the County Council—in the year 1903 the premises that secured licences numbered 336. Here one may notice, too, the temperate temperance policy followed by the Council in connection with London improvements, which up to the year 1903 had led to the abandonment of 113 public-house licences of a value estimated at nearly £300,000. In carrying out the Holborn-Strand improvement alone the Council has reduced the number of London's public-houses by no fewer than thirty-five.

We now come to one of the newest as well as one of the most important duties of the Council—the education of the children of London. Some

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760,000 elementary school pupils are provided with instruction. The work costs £4,000,000 a year, and employs 20,000 teachers. A scholarship scheme has been inaugurated which will in five years mean the provision of education and some maintenance for 12,500 scholars. The office staff alone is larger than that of the Board of Education, the Scotch Education Department, and the Irish National Board combined. "The London boy has never had a chance of education like the Scotch or the Welsh or the German boy," says Mr. Cornwall. "We are trying to remedy this defect."

Many other branches of the County Council's work might be mentioned. For instance, it ministers to the mind diseased—15,000 lunatics being dealt with each year. Its Parliamentary work, too, is so extensive that each Session it is called upon to consider on an average about fifty private and forty public Bills affecting London. But enough has been said to show the position of the Council in Mr. Cornwall's year. Comparing England with the United States, Mr. Cornwall thinks that on the broad principle of self-government, we have nothing to learn from America. Though on many points of administration our system leaves room for improvement, he is satisfied that England is the home of representative government and leads the world in municipal affairs.

Mr. Cornwall stands for economy, cleanness of administration, and progress, and perhaps the greatest of these is progress. "Do not let us go back," he says; "do not let us stand still." As a fitting expression of what we may call the London County Council spirit, the adjuration is not bad.

LEGISLATIVE PATCH-WORK

LEGISLATING FOR COMPANIES WITH LIMITED LIABILITY—HOW MERCANTILE INTERESTS HAVE BEEN TINKERED WITH IN PARLIAMENT FOR FORTY YEARS —A STUDY OF INEFFICIENCY

BY

E. W. GUNDRY

SOMEWHAT over a century ago a well-known character, in a fit of despondency, called us a nation of shopkeepers. It is not necessary to discuss to-day the accuracy of such a description of the business capacity of our great-grandparents; it suffices that no sane person would pay such a compliment to us at the present time if he were to base his judgment on the way our lawmakers lay down the lines and principles upon which our great mercantile interests are to be conducted.

One out of many examples is the attitude adopted in legislating as to companies with limited liability. During the year 1903, 3957 companies, representing a nominal capital of £124,951,990, were registered in Great Britain alone, without including the registration in the adjacent islands under their own laws, or the companies registered under special Acts of Parliament. To deal with these, in addition to the Statutes and Common Law of the Kingdom regulating the general conduct of commercial morality, there have been enacted the principal Act of 1862 and sixteen Amendment Acts, each dealing with some special points or abuse arising out of the principal Act or out of one or more of the so-called Amendment Acts, due, in many cases, to the putting into ambiguous language of a well-defined principle of the Common Law already existing. For the purpose of adding to this artistic piece of crazy-work, thirteen business men (*absit omen!*) have been appointed, and for some extraordinary reason have consented to solemnly consider, and waste their valuable time over, three points arising from the inefficiency of an Amendment Act which has been only three years in operation, and a fourth—that of companies registered elsewhere than in England raising capital in this country. As to the last, the intention of the reference is no doubt to deal with a few well-known frauds registered in Guernsey and the Transvaal, but in dealing with these, registered companies in other foreign countries would be affected, and questions of policy much

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wider than can be dealt with by this Committee must arise. The report of this Committee will for practical purposes therefore be of value only on the questions of prospectusless companies, the registration of debentures and other charges issued prior to 1901, and what is known as "Table A," which is the model form of Articles of a company scheduled to the Act of 1862, a form never adopted by any public company, and only in a minority of cases in small private concerns.

The record of legislation on this subject is almost grotesque in its inefficiency. The principal Act was hardly dry when it was discovered that limited companies sometimes traded abroad, and that it would not always be convenient for directors to take continental or colonial trips for the purpose of applying their mystic seal; and the Companies Seal Act was passed in 1864. An Act with no fewer than forty-seven clauses was the product of 1867, relaxing and strengthening various regulations which had found need of modification, and this was followed in 1870 by the Arrangements Act. A rest then was taken until 1877, when Parliament in due form explained what was meant by some of its remarks in 1867. In the meantime also the Glasgow Bank had failed, and banks with limited liability had a little Act all to themselves in 1879. The next year produced the *chef d'œuvre* of the series, by which a company was permitted, if it were so minded, to distribute its profits by way of increasing the liability on the shares. The most imaginative Board in their most fantastic reorganisation have never ventured to avail themselves of this. The years 1883, 1886, and 1888 contributed their quota to the list, while in 1890 there was quite a debauch—no fewer than three Acts were passed, a new department was added to the Board of Trade, with special attention in the Law Courts, and such a general sweeping with new brooms took place that the poor public saw in the dust visions of a millennium. The vision solidified, however, into the disastrous result of the Liberator liquidations and the Promoters' boom of 1896.

The tale of amendment was taken up again in 1893, after which the humour of the situation was appreciated, and this brilliant if somewhat cumbersome history was, by a Bill passed in 1896, shortened in description to "The Companies Acts of 1862 to 1896," a Bill which has been almost as useful as the rest of them put together.

The year 1898 saw fresh attention to the subject, and in 1900 was produced the great Amendment Act, which already is found wanting in the subjects referred to the present Committee, and will require considerable repairs when, after trade has returned to more prosperous times, the company-monger sets up again in business after his long rest since 1899.

Those who *know* pointed out these omissions from the first, as they have also called attention to the dangers of companies coming out with certificates from an Inland Revenue official, for all the world like patent medicines, and to the fear that a new profession of company directors will arise if the position of director is made so complicated that ordinary business men—the men who are wanted—will leave the office to any guinea-pig who will take it. Has not an Institute of Directors already been founded? They have pointed out that the promoter was correct in theory when he said that the public only care about the front page—where the names are in big print—and care next to nothing about the last page, where is set out in small print and in the language of the law the particulars of promoter's profits, commissions, contracts, and so forth.

Moreover, the public instinct is well founded: a company with honest directors, managers, and auditors will be honestly conducted. It may be a failure, but it will not be a fraud. No number of Inspector-Generals, Registrars, and Official Receivers (it almost sounds like the War Office) will assure success, but the time has arrived when the question should be dealt with as a whole, and not tinkered with piecemeal. The excellent thirteen are just the men to report and to sketch a plan which will be sane and business-like, doing what is intended to be done. To play the part of the local plumber is to court the result which usually attends his work, from which we all devoutly wish to be protected when it is our misfortune to meet with it, whether in our waste-pipes or in our Parliament.

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THE PRIVILEGES OF AMBASSADORS

FOREIGN REPRESENTATIVES ON THEIR "NATIVE HEATH" IN LONDON—WHAT THEY MAY DO WITH IMPUNITY—EXEMPTION FROM TAXES—AN OLD ATTEMPT TO ARREST A RUSSIAN AMBASSADOR FOR DEBT—MISTAKES OF THE POLICE—A CHINESE GHOST

BY

HAROLD MACFARLANE

IN all probability public attention has never in the history of diplomacy been so firmly riveted on the Ambassadorial world as has been the case since the advent of King Edward to the throne. For many years the sovereign had refrained from making the acquaintance of the little bits of Britain to be found in every European capital; and only at rare intervals had a Continental monarch stepped on that portion of his dominion that is situated in the West End of London. King Edward, however, has revived the custom of exchanging visits with his fellow monarchs, and they in turn have made themselves familiar with those portions of their respective territories that are bounded by the streets of the Metropolis.

When in Vienna recently King Edward gave a luncheon at the Embassy to the Emperor Francis Joseph, he began his speech, when proposing the health of the august guest, with the words "As we are upon British soil," a statement that supplies the very keynote of the Ambassadorial position. When the American Ambassador, for instance, climbs the steps of No. 1 Carlton House Terrace, it is no figure of speech to say that his foot is on his native heath, for he is in point of fact occupying as many square inches of the soil of the United States of America as if he were standing in the centre of New York. The only difference, indeed, is that whereas in New York his precedence would merely be that of a singularly able American official, in London he and the ambassadorial college follow immediately after the Royal Family and before the Archbishop of Canterbury, who notwithstanding the fact that he is a commoner born, takes precedence before the whole British aristocracy apart from royalty. In brief, in New York the Ambassador is Mr. Whitelaw Reid, in London he is the representative of the President of the United States.

The privileges that an ambassador enjoys when on duty are manifold; at home he may be untitled and a comparative nobody, but in the capital he is accredited to he enjoys all the prerogatives of an Emperor or a President.

That an ambassador is exempt from taxes goes without saying, for he is exempt from all cash payments in the sense that the same cannot be enforced by law. That he pays his bills and his rates which, unlike taxes, are applied for, is simply an act of grace on the part of an ambassador and his suite.

So far as Great Britain is concerned the immunity from arrest for debt that ambassadors enjoy dates from Queen Anne's reign, when a special Act of Parliament was passed to that effect in order to soothe the savage breast of Peter the Great, whose ambassador was arrested one day and removed from his coach on account of a little matter of £50. When the representative of the Tsar of Russia complained to the Queen, an inquiry was instituted, the ambassador was released, and when seventeen people concerned in the arrest had been committed to prison and prosecuted in the Court of Queen's Bench, the authorities seemingly imagined they had got out of an awkward hole rather cleverly. They had, however, counted without their Tsar, for when the affair came to the ears of that infuriated monarch he immediately demanded that the Sheriff of Middlesex and all others concerned in the affront put upon him through his representative should be instantly put to death—the method of bringing about their untimely obsequies being left to the British authorities. It was then that those in authority, seeking a salve for the wounded feelings of the Tsar, resolved upon passing an entirely new and original Act of Parliament for their future guidance. Having engraved and elegantly embossed the same on parchment, they joyfully forwarded it with a letter of apology from the Queen

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to the outraged monarch, who was not only pleased to accept the apology but requested that the offenders should be discharged from further prosecution.

So punctilious are ambassadors about paying their bills nowadays that their immunity from arrest is sometimes forgotten. As a matter of fact a case in point occurred in Paris in August 1900, when M. Homere Morla, representing the Republic of Equador, was sued by a Paris tradesman for a debt of £2400. The Court, however, promptly non-suited the plaintiff with the remark that the immunity enjoyed by a foreign representative made proceedings against the diplomat impossible. A few months earlier in the same year this privilege was claimed by a gentleman named Dastis, when two tradespeople sued him before Judge Lumley Smith at the Westminster County Court. The defendant to the action, which was on account of unpaid bills for clothes and boots, claimed to be the Secretary to the Legation of Uruguay, a position worth £1200 a year in fees. Instead of dismissing the plaintiffs on this occasion the Foreign Office was appealed to, with the result that the post filled by the defendant was said to be that of Vice-Consul, a being who is not privileged from arrest, and forthwith he was ordered on pain of committal to pay £4 a month on each summons.

That the law or etiquette on the subject is decidedly intricate was proved by the fact that when a delegate of the Portuguese Government struck one of the employees in the Portuguese Colonial Pavilion at the Paris Exhibition of 1900 the Court rejected his plea that the assault took place in what was technically Portuguese territory, and therefore beyond French jurisdiction, and he was called upon to pay a fine and damages.

Judging from the fact that when, two years ago, the sister of the Baroness von Sternberg, the wife of the German Ambassador at Washington, was placed on the official diplomatic list issued by the State Department, a considerable amount of annoyance was caused in the diplomatic world—the lady being a Miss Langham of Kentucky and by no means a subject of the Kaiser—it appears that all matters of precedent in respect to ambassadorial households are far from being settled. Although there may be some lingering uncertainty about ambassadorial etiquette with regard to royal courts there certainly is none in respect to police courts, to which ambassadors cannot be taken against their will either as criminals or witnesses. The United States authorities discovered this fact as long ago as 1856, when, the Dutch Minister's presence as a witness in a case tried at Washington being desired, he declined to attend the Court, and was backed up in his decision by the Government of Holland, to whom the American Government appealed. History, it will be remembered, repeated itself in 1898, when in the course of the Zola trial, a side issue of the Dreyfus affair, the military *attachés* of the German, Austro-Hungarian, and Spanish Embassies refused to renounce their diplomatic immunity until they had referred their positions to their respective governments.

Although this custom is generally known it occasionally happens that a too zealous constable bears off to durance vile a member of an ambassador's suite, and is promptly called over the coals by those who are not ignorant of the fact that the immunity of the ambassador extends to his household.

Cases in which "ex-territoriality" is claimed do not frequently occur, nevertheless in 1898 and 1900 two such engaged public attention for a short time. In the earlier of these diplomatic incidents the *dramatis personæ* included Mr. Spencer Eddy, one of the Secretaries to the American Ambassador, and Mr. J. E. White, son of Mr. Henry White of the American Embassy. These two gentlemen had the temerity to ride their bicycles on the footpath in the vicinity of Winkfield, Berks, and although they had in all probability every excuse for doing so by the state of the roads, they were duly summoned by a too zealous constable. Metaphorically wrapping themselves in the Stars and Stripes, the diplomatists claimed "ex-territoriality," with the result that after an appeal to the Home Secretary, the Maidenhead magistrates had no alternative but to withdraw the summons, whereupon peace again reigned between the United Kingdom and the United States.

The second of the two cases, which came before the Magistrate at Marlborough Street Police Court, was hardly so satisfactory. A footman was found lying outside a public-house, and being unable to give any account of himself was promptly taken in custody. When his case was called, however, the prisoner claimed the privilege of international law, stating that he was the servant of the Swedish Ambassador. And as proof was forthcoming in support of his claim, the magistrate was obliged to allow him to return unfined to that portion of Sweden that lies in Pont Street, W.

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Although it is customary for diplomatic agents to furnish the authorities to which they are accredited with lists of their employees in order that undue advantage should not be taken of the custom of immunity, the privilege has its disadvantages, as was proved some years ago when an ambassador was only too anxious that a member of his household should stand his trial for a criminal offence, and it was found that our police were powerless to arrest him. The difficulty was finally got over by the exercise of much circumlocution; an extradition warrant was applied for in the criminal's own country, and the arrest effected by foreign police who returned with him to his native land. In due course the offender was committed on the warrant, and the man again brought back to England for his trial.

A few months ago a writer in *Notes and Queries* stated that the portion of the Chinese Empire that looks out upon Portland Place, W., was haunted by the spectre of one Chow, an *attaché* who died at the Embassy some years ago. The spook was clearly identified by one who knew the diplomatist in the flesh and who met it on the staircase, and to exorcise him would have presented a most interesting problem for the Society of Psychical Research. But No. 49 Portland Place being a fragment of the Flowery Land, and the ghost being to all intents and purposes a member of the ambassador's suite, it was of course impossible for the scientific ghost-layer to exercise his craft upon the wanderer, who would probably have keenly resented any attempt to remove him from his haunt other than by a letter of recall from Peking.

An ambassador may engage with impunity in treasonable plots against the ruling monarch or government of the country to which he is accredited, a privilege that was indulged in more than once in the reign of Queen Elizabeth. He can, moreover, smuggle as many things as he likes into the country without the Customs authorities being able to stop him. But he must not keep a monarch waiting either on his doorstep or elsewhere.

When, a few years ago, the Kaiser dined with Sir Frank Lascelles at the British Embassy at Berlin, he remarked to the younger members of the staff, "Have any of you fellows seen your ambassador in bed? I have." As a matter of history the Monarch did catch the British Ambassador napping on one occasion, but it was not the fault of Sir Frank that he was not ready to greet his royal guest when he stepped on to the territory of Great Britain in Berlin. It appears that on the morning of the day following Sipido's attack upon the King (then Prince of Wales) at Brussels, the Kaiser without formality hastened to the Embassy to offer his congratulations upon his uncle's escape, an honour that was entirely unexpected by the officials at the Embassy, with the aforementioned result.

When Lo Feng Luh presented his credentials to Queen Victoria, together with a translation in French—they were beautifully written, or rather etched, in immense characters on a parchment over five feet long—he nearly and inadvertently kept the Queen waiting, and in point of fact did keep the late Marquis of Salisbury and the other Ministers who were to conduct him to Windsor cooling their heels on the platform of Paddington Station. Seemingly the Chinese Ambassador had, by the error of a Foreign Office official, been led to believe that the special would leave Paddington at 1.20, instead of 1.10, with the result that when he arrived at the station the engine was whistling for departure. An ambassador may turn his back on a King when leaving the presence, and when bidding adieu to a Queen he may retire sideways like a crab, but it is believed the sight of Lo Feng Luh sprinting along the platform at Paddington exceeded in eccentricity any exit or entrance through double folding doors (another privilege that can be claimed) ever perpetrated by a diplomat in a hurry.

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THE FORCED RHUBARB OF LEEDS

AN IMPORTANT INDUSTRY—RHUBARB-GROWING IN DARK SHEDS—THE SOOT AND SULPHUR CARRIED TO THE EARTH WITH RAIN ARE SAID TO GIVE THE SOIL NEAR LEEDS ITS PECULIAR VALUE—HOW THE GROWER WORKS

BY

W. MEAKIN

THERE is something decidedly incongruous in the association of the West Riding of Yorkshire with the early production of fruit or vegetables. When we think of such things our thoughts fly to the island gardens of Jersey, Guernsey, and Scilly, and to Cornwall, our "English Riviera"; favoured places, which Nature has so richly endowed with fruitful soil and genial climate that the gardener takes time by the forelock and anticipates the seasons. Yet in the early production of rhubarb the sunny South cannot compete with the great Northern county, with its wind-swept hill-sides and cold bleak winters. If we take the trouble to inquire the origin of the slender, bright-hued sticks of rhubarb which appear in the shops and markets about Christmas time, we shall find that they come from a district having for its centre the great industrial city of Leeds. In this region, where the winter skies are more often grey than blue, and where hundreds of tall chimney-stacks send forth streamers of black smoke, a vast harvest of rhubarb is gathered during the first three months of the year.

There is a spice of romance in the story which tells of the beginning of this industry. It is said that some forty years ago, or thereabouts, a resident of Kirkstall, near Leeds, one day conceived the idea of putting in an empty cupboard near the kitchen fire three rhubarb roots from his garden, with the object of hastening their growth. He was so struck with the excellent result of his experiment that he pondered the matter and tried again on a larger scale. Whether the cupboard story be fact or legend, the man with whose name it is associated founded the present rhubarb forcing industry, and the chief factors in the methods he adopted were darkness and warmth. In those days the desire for things out of season was not so keen or so widespread as at the present time. Most people were content to await the advent of fruit and vegetables at their natural season, but that was mainly because few efforts were made by gardeners and nurserymen to foster a demand for early produce. The period of midwinter was just the one when the ordinary housewife's choice was most limited, and it can be easily understood that when rhubarb began to appear in the shops in the first months of the year, there was soon no lack of customers. The enterprising Kirkstall grower found his business rapidly increasing, and in the course of a few years he acquired a respectable fortune. Meanwhile other gardeners and farmers in the neighbourhood discovered the method of procedure, and the industry gradually extended over a wide area. To-day it has assumed enormous proportions, and many thousand acres of land are devoted entirely to rhubarb culture. Kirkstall still remains an important centre, while forcing sheds appear at intervals for a considerable distance along the valley of the Aire, and on the hillsides overlooking the river. A great development has also taken place in the district lying between Leeds and Wakefield, and in one part the rhubarb fields extend continuously for fully two miles. In this particular neighbourhood exceptionally good results are obtained. It is generally supposed that the soil possesses unique qualities specially favouring the growth of rhubarb, but whatever may be the cause, the sticks are held by the growers to be larger and more vividly coloured than those produced in the Kirkstall district. It is estimated that from the whole of the rhubarb forcing area an average weight of seventy tons a day is despatched during the season, which lasts, roughly, from Christmas to April. The quantity is naturally less during the first few weeks, but it is said that as much as a hundred tons have been forwarded to London by one railway company in a single day in March, when the season is at its height. The trade

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now extends to every part of Great Britain and Ireland, while a large Continental connection has been developed, considerable quantities being shipped to Rotterdam, Hamburg, and other ports.

How, it will naturally be asked, is this abnormally early growth produced? It may be thought that large areas of land are under glass, as in Guernsey. As a matter of fact, glasshouses play no part whatever in the process, and the rhubarb is forced by a method quite the reverse of the one we were taught as children to regard as Nature's. In ordinary fruit and vegetable culture, light, air, and space are essential, but the chief requisite in the Yorkshire method of forcing rhubarb is absolute darkness, while the roots are packed as closely together as it is possible to get them.

Much discussion has taken place locally at different times as to the reason why this district, apparently disadvantageously situated for the purpose, should be able to produce rhubarb so long in advance of warmer and more sunny counties. Many people hold the opinion that it is entirely due to the soil, which is mainly of a heavy nature with stiff clay bottom, but a grower of my acquaintance stoutly refuses to accept this explanation, and his rebutting argument is certainly a very strong and practical one. He has about ten acres of land, which is divided into three fields, under rhubarb cultivation. The fields do not adjoin each other, and present three different varieties of soil: one being stiff and heavy, another medium, and the third of a very light nature with gravel subsoil. Yet equally good results in the way of crops are obtained from each field. He attributes the suitability of the district for forcing purposes to the soot and sulphur which are carried to earth with every shower of rain. It is very probable, however, that the growers are able to profit by such early production mainly because of the bleakness of their climate, strange as this may sound at first. To explain this I must make a slight digression. There is naturally a very keen competition to get the first consignment of rhubarb on the market, as the earlier a crop can be grown the greater is the profit forthcoming. Consequently, many experiments have been made having this object in view, but the growers have found, sometimes to their cost, that their craft has its limitations. Experience has taught them that after the rhubarb dies down in the autumn, a certain silent, invisible process must be accomplished in the root before the time for forcing arrives. There is no infallible test for this, and occasionally a grower has filled a shed two or three days before the usual time—thinking that his roots were ripe, and fondly hoping for exceptionally early results—to reap only a partial crop; while in another shed, filled, say, three days later, with similar roots, splendid results have been obtained. Now, owing to the climatic conditions in this district, the rhubarb dies down sooner than in the South, and is therefore ready for forcing at a correspondingly earlier date. It is also very likely that the soil has peculiar qualities which favour the growth of very strong roots—in some of the gardens in the forcing district the rhubarb grown under natural conditions attains an immense size—while the method of forcing plays no small part in the final results.

Those readers who have visited Kirkstall Abbey in late summer or early autumn can hardly have failed to notice, almost under the shadow of the old ruins, several peculiar shed-like structures rising here and there in the midst of fields of rhubarb, with all the season's produce dying down, as though a rich harvest had been abandoned to neglect and waste. These are typical rhubarb fields. The structures seen were forcing-sheds, and the neglected rhubarb roots were undergoing a period of convalescence after surviving an unwonted shock to the system. In the forcing-sheds the roots do the work of a whole winter and spring in from two to six weeks, and the fields are the hospitals whither they are afterwards transferred, either to die from sheer break-down, or gradually to win back health and strength.

The sheds are by no means elaborate buildings, some of them in fact being quite primitive in construction. The favourite size is thirty yards by twenty, but some are thirty yards square. The height is about six feet, and the roofs are generally flat. Some growers prefer them to be slightly sloping, but in no case to such an extent that rain is carried away before any of it can penetrate through cracks and crevices into the shed, the reason for this being that a good deal of moisture is required in the forcing process. The material of which the sheds are built varies according to the fancy and purse of the grower. Some consist entirely of wood, while others have brick walls with wooden roofs, the latter often being covered with a species of waste obtained from the mills. This prevents the ingress of light and adds to the warmth of the shed, while allowing rain-water to percolate through to the cracks. Nothing further is required

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with the exception of two or three flues for providing heat.

It may be remarked here that owing to the uncertainty of the results when specially early crops are required, very small sheds are used for the first roots taken from the fields, thus reducing risk of loss to a minimum. The big sheds are not filled until the readiness of the roots is beyond doubt, and some of the old growers have a fixed day, to which they rigidly adhere, even if the roots appear to be ripe many days earlier. This rule-of-thumb method, based on a long experience, will not be regarded as unwise when it is considered that the roots from an acre of land—about six thousand in number—are required to fill a shed thirty yards by twenty in size, so that even a partial failure would be a very serious matter. The roots are placed close together on the floor of the shed, until every available foot of space is taken up, with the exception of narrow pathways, which are so arranged that access to all parts of the shed can easily be obtained for watering and pulling purposes. The practice in regard to the use of soil varies, some growers scattering it thinly, while others almost cover the roots. In like manner, individual experience decides whether manure shall or shall not be used during the forcing period. Watering is essential, and for the first crop a considerable amount of time has generally to be spent in this work, as the rainfall in January is not usually heavy. In February and March, however, less trouble is involved in this direction, as a great deal more moisture can be relied on to find its way through the roof. Within a very few days of the transference of the roots from the fields to the sheds, thousands of little shoots begin to appear, and before long the light of a candle or lamp reveals a dense thicket of rhubarb sticks, already showing a brilliant hue of red, and tufted with half-unfolded yellow leaves. Both these characteristics are due to the darkness in which the forcing takes place, and if daylight were admitted to the sheds the produce would be practically unsaleable by reason of its unattractive appearance.

During the season the forced rhubarb grower can hardly call himself a free man. The sprouting roots—which are sometimes touched by disease—require a great deal of supervision, and the flues demand constant attention. It is when the pulling stage is reached, however, that the strain becomes acute. When the income of a year depends upon the result of a few weeks' crowded labour, every hour is precious. Piles of boxes are placed in readiness outside the sheds, and the work of pulling and packing is often in progress by two or three o'clock in the morning. The first large batch of roots generally takes six weeks to produce a crop, and when this is gathered not a day is lost in clearing out the shed for the reception of a fresh lot. These have generally made such progress towards fruition that three weeks suffice for forcing, while the growth of the roots which are put into the shed later is often so amazingly fast that they are removed again in a fortnight, having in the meantime produced a thick crop. The effect of this abnormal strain on the roots has been indicated above, and a period of three years must elapse before they sufficiently recover to be again available for forcing. After removal from the shed, they are planted closely together in long lines stretching from end to end of the field, and they are allowed to remain thus during the following summer and winter. With the advent of the second spring, they are dug up for sub-dividing purposes, and a certain proportion is generally found to have been too impoverished for survival. The remainder are then planted out in well-manured land, with ample space allowance, and they are not again disturbed until two summers have gone by. The sprouts they send forth are not gathered, and the decayed stalks and leaves serve further to enrich the ground, while the roots gradually accumulate a fresh store of strength and vigour. The fields are so arranged that an adequate supply of roots for forcing is available each year, while some portion of the land is always at rest, thus securing the maximum of fertility. Generally speaking, only two varieties of rhubarb are used for forcing, these being named "Victoria" and "Prince Albert."

A tendency has been shown recently to adopt the dark-shed system of forcing near Manchester, in Lincolnshire, in the vicinity of London, and in other districts, where previously rhubarb could not be grown to any extent before March. The industry in the Leeds district has become so firmly established, however, and the growers have won so excellent a reputation for the quality of their produce, that they have little to be afraid of in the way of competition, while so far as early growth is concerned they will probably always retain first place.

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WORK AT THE BRITISH LAKE VILLAGE

THE DISCOVERIES AT GLASTONBURY—FRAGMENTS OF ANOTHER WORLD—CIVILISATION THREE HUNDRED YEARS BEFORE THE CHRISTIAN ERA—EXCAVATION TO BE CONTINUED THIS MONTH

"WHEN fully worked out it will probably throw a flood of light on the history of pre-Roman Britain." Thus spoke Professor Boyd Dawkins twelve years ago with reference to the discovery of the lake dwellings at Glastonbury, in Somerset. Though it is not fully worked out yet —the work of excavation is about to be resumed —the labours of the devoted band headed by Mr. Arthur Bulleid, L.R.C.P., F.S.A., the gentleman to whom belongs the distinction of having made the original discovery of the dwellings in 1892, have produced results sufficiently interesting to antiquarians all the world over. Among the attractions for tourists in the holiday season, too, the Lake Village is happily worthy of a town which boasts not only the famous Abbey ruins but also associations with Joseph of Arimathea and the Isle of Avalon.

It is believed that the occupation of the village was probably commenced about 300 B.C. and closed with the Roman invasion. The relics are proved to be of the pre-historic iron age, and the discovery of the village is important as connecting the period of the bronze with the iron age. The site of this remarkable settlement, which is three and a half acres in extent, is in the Brue district, some fourteen miles from the sea. Long ago the moor was open to the sea, but later it was gradually cut off and converted into a lake, and thence, in course of time, into swamps and meres. In the year 1500 five of these lakes were still in existence, the largest of which was Mere pool, five miles round. Some 2000 years ago the "village" was probably on the margin of Mere pool. Alders and willow-trees grew in the shallows between the pools of water and reeds, which fell and accumulated, forming peat. In this layer of peat the archæologists found charcoal, bones, and chips of wood, this giving the date when the people settled at the spot.

Before excavations were begun all the eye could discern was about seventy low mounds, varying from 6 to 23 in. above the level, huddled in the corner of a field. These mounds were the débris and sites of dwelling-huts, and the foundations on which they stood consisted of layers of brushwood and stems of small trees bound together: in some places, at least, with transverse mortised beams, precisely similar to the Scottish and Irish crannogs. The huts were circular or oval, and varied in size from 26 to 35 ft. in diameter. Each hut contained a central hearth, sometimes neatly made by flat stones embedded in the clay flooring, which existed in all of them. But as subsidence, due to the compression and decay of the under-structure, progressed, the occupants superadded new clay flooring. The relics illustrate with rare completeness the life-history of the community which inhabited them. Many of them exhibit the special characteristics of late Celtic art, which gives the collection an exceptional importance among lake-dwelling remains discovered within the British Isles.

The visitor to Glastonbury may form his own idea of what manner of people the lake dwellers were. In order to do so, he has only to enter the crowded little museum in the centre of the town, where the relics are displayed to tell their own tale of a bygone civilisation. The collection shows that the lake-dwellers were spinners and weavers, using whorls of stone and earthenware in twisting their thread, and weights to keep the warp tight on the loom, while they worked in the weft with bone shuttles. The weft was pushed home with the weaving comb—which Professor Dawkins describes as probably the ancestor of the comb worn for ornament in the head-dress of later times. Numerous wooden fragments of a kind of frame which have been found probably represent the loom; and it seems likely that flax was the material which was woven. The lake-dwellers used bone needles for sewing. They worked wood with great skill with the saw, the bill-hook, the knife, and the gouge, and probably also with the axe and the adze. A splendid specimen of an ancient boat which had been cut out of a solid log is one of the most prized relics. Flint flakes and knives and a flint core prove that flint implements were made at the village. Of timber, two wheel-

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spokes, finely turned and finished, were found last season, and a fragment of an axle-box belonging to the same wheel. The inhabitants of the lake-village also used the lathe; and are proved by the "chucks" of Kimmeridge Clay to have turned ornaments of Kimmeridge shale, some of which have been discovered. The lathe-turned vessels, some bearing the marks of a punch found in the settlement, prove that pottery-making was also carried on. About a wheel-barrowful of wheel- and hand-made pottery, in fragments, was found last year—nearly all the pieces being ornamented. Crucibles imply that melting was also carried on; a piece of blue glass slag may perhaps imply that glass-working was also practised; and file implies metal-working. They used rings of jet, amber, and glass, and of bronze, and bracelets of bronze and Kimmeridge shale, and beads of glass, and fastened their clothes together with safety-pins and split-ring brooches of bronze, and with bone links. Among the bronze objects found is a mirror—"doubtless wept for by some lady when it was lost," the visitor murmurs. They also used amulets of bone, among which is a roundel fashioned out of a human occipital. They grew wheat, and had sheep, cattle, pigs, horses, and dogs. They did not, however, rely wholly on the domestic animals for food, but at times ate the stags, roedeer, beavers, and otters living in the district. A great many remains of birds have been found, among them those of the pelican and the crane. The lake-dwellers ground their corn in well-fashioned querns, and boiled the food by putting hot stones into the pots filled with cold water.

Gambling and cheating are suggested by the discovery of dice, so constructed that they could not pitch on the low numbers; and a spur of a fighting-cock renders it probable that they were given to cock-fighting like the ancient Gauls. The lake-dwellers rode or drove horses with iron snaffle bits, and fought at close quarters with daggers, halberts, and bill-hooks, and at a distance with slings. Vast numbers of clay pellets for slings, both burned and unburned, have been met with. The position of the settlement in the marsh implies the fact that warfare was the normal social condition, and testifies to the danger of attack from neighbouring communities. A strong palisading of posts and piles surrounded and protected the village. The piles are from 3 to 9 in. in diameter and from 5 to 13 ft. in length, kept together by more or less coarse hurdle work. Although in many places they are much displaced and decayed, yet they form a fairly perfect and continuous, though irregular, outline; at some parts placed so closely together that from fifty to seventy have been counted in the space of 10 ft. The majority slope outwards, at angles varying with the state of preservation of the border; but a large proportion of them were undoubtedly driven in vertically, and have been either broken off or gradually forced out into their present position. Some piles barely reach the true peat, whilst others pierce it for several feet. Occasionally a few vertical piles are still seen among the slanting, and probably show repairs to the border. The border of the village has a very irregular outline, the piles being arranged in varying curves. This unevenness has been proved in some places to be due to extensions of the village. The surface of the border immediately inside the piles is formed of trunks of trees and large pieces of timber placed side by side parallel to the margin, and reaching 8 to 12 ft. inwards; underneath these more timber is found alternating with layers of clay and brushwood, with which are intermingled patches of stone, peat, rush and bracken, to the depth of 4 or 5 ft.

A fragment of human skull, long, and with a low forehead, and strong frontal sinuses, implies that some of the inhabitants belonged to the long-headed section of the Britons. A shaft of a human humerus, gnawed by some weak-jawed carnivore such as the dog, was also found in one of the huts. As to the appearance of the inhabitants, it is supposed that the skulls found are those of people of neighbouring tribes brought in after a skirmish. A complete skeleton has not been found, so that there is nothing to prove that the skulls are those of the inhabitants or some of their enemies living on the hills about Glastonbury. It is also a question whether the village was in continual occupation, for it might have been deserted in the winter and only used in the summer when the people were feeding their stock on the flats around.

The work of excavation will be resumed by the Glastonbury Antiquarian Society, of which the Rev. Prebendary Grant is president, about May 12, and continue till June 10. Last year the lake-village was visited by the Royal Archæological Institute; and this year also various societies propose to visit it while the excavations are going on. Meanwhile, the Committee appeal for funds to carry forward the further disclosure of this little "Western Venice" of the Glastonbury fens, and give the assurance that such support will be "gratefully received and judiciously expended."

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THE WORK OF THE PROFESSIONAL MICROSCOPIST

THE VERY FINE ART OF MICROTOMY—FACE TO FACE WITH THE MANY USES OF THE MICROSCOPE FOR ZOOLOGICAL, MEDICAL, AND OTHER PURPOSES—THE MATERIAL AND THE MAN

BY

WILFRED MARK WEBB, F.L.S.

THE ordinary member of the community is seldom brought face to face with the microscope. Should he by any manner of means be inveigled into attending the *soirée* of some Natural History Society, he will no doubt meet with an array of brazen, if silent, instruments which, it is no libel to say, his lady friends will often call "telescopes." Under these there may be seen many quaint and curious things—the delicate flinty skeletons of diatoms, wheel animalcules in all their living beauty, gorgeous wing-cases of diamond beetles, and perhaps the organisms that give rise to malaria or to "sleeping sickness." Though not often seen in public, the microscope has its work to do in education, in science, in medicine, in commerce, in jurisprudence, to an extent which renders its duties as a popular entertainer quite insignificant.

One of the best ways of getting an inkling into the subject in hand, is to pay a visit to a professional mounter, or perhaps we should say to several of them, for there are so many branches of what Mr. H. G. Wells calls "the very fine art of microtomy" that it is impossible for one man to practice them all. We will first journey in imagination to the borders of Kew Green, where is the laboratory of Mr. Martin J. Cole, who is known as the "younger Cole," having forsworn a nautical life which nevertheless has left its impress on his genial character, to follow in the footsteps of his father, whose motto *Cole Deum* was well known to microscopists of the older generation.

A stroll round the spacious room at Kew will give some idea of the particular lines of work followed by its owner, for neatly arranged on shelves are hosts of small wide-mouthed bottles in which are carefully stowed away pieces of the substances—or in technical language, the "material"—which he uses. For instance, on one rack we find such things as "three year old stem of pine," "leaf of sunflower," "aërial root of orchid," "ovary of lily," "capsule of moss," and these exist where they are for the ultimate benefit of students, medical and otherwise, who need to know the structure of typical plants.

What Mr. Cole has to do is to cut a slice so even and so thin that when it rests on the centre of a little glass slip, three inches by one, it is to all intents and purposes transparent. He does it in this way. He takes a suitable piece of material which has been hardened by long keeping in strong methylated alcohol, and embeds it in the centre of a plug cut from a carrot and split into two for the purpose. This carrot plug is made to fit into a pit in a solid but simple brass instrument, and by a very fine screw the carrot and the material can be raised to an infinitely short distance above the edge of the pit. A dextrous cut from a section knife, fashioned in the form of a large hollow-ground razor, and lubricated with spirit and water, removes a thin slice. The screw is turned slightly, more or less according to the thickness of the sections required, and the process can be repeated time after time. It is necessary that the section, when obtained, should be fixed to the glass slip and protected from injury. The medium used to fulfil the first condition varies in different cases, but it is chosen as a rule with a view to rendering the section even more transparent. A simple method is to remove the spirit by soaking the specimen in water and then to mount it in a drop of glycerine jelly (glycerine and gelatine) melted for the purpose. After this it is carefully covered with an exceedingly thin disc of glass of suitable size. As the jelly cools, the glass disc is caused to adhere to the slip, but to make matters sure the slip is temporarily fastened when it is cool

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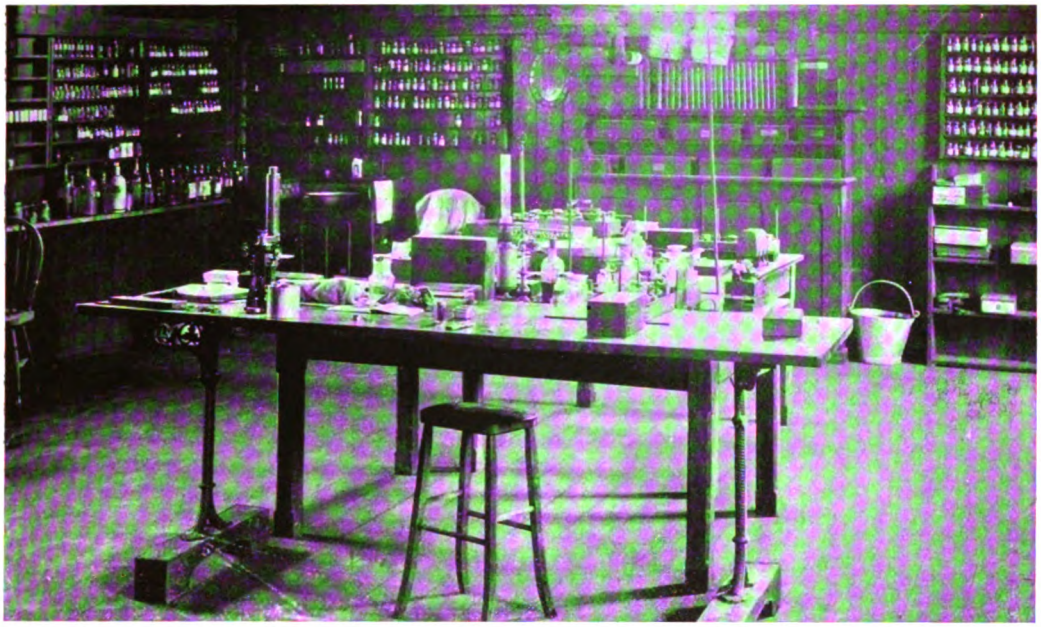
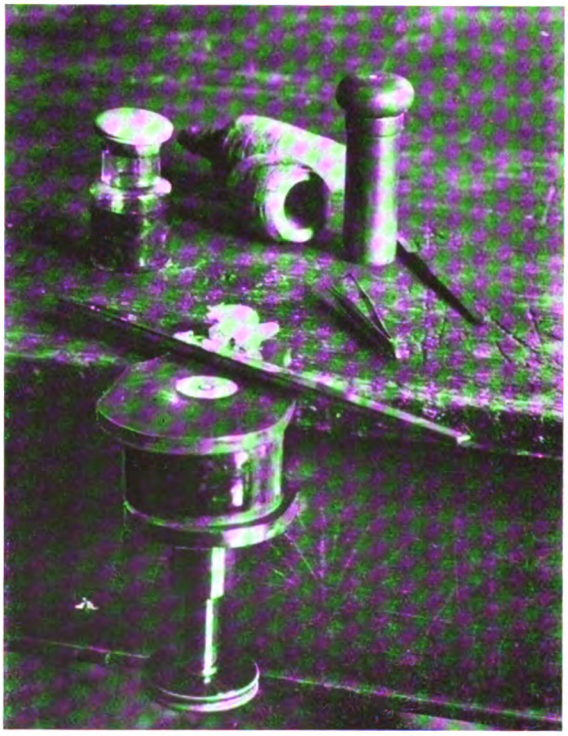


MR. COLE'S MICROSCOPICAL LABORATORY AT KEW

to the centre of a little turn-table, and while it is revolving on the latter, cement is applied with a brush so as to form a ring which covers the margin of the disc and gives the "slide" a neatly finished appearance. Another alternative is to mount the section in Canada balsam dissolved in benzole, chloroform, or turpentine, the specimen having been previously "cleared" of spirit by having been submitted to the action of clove oil. When the balsam has dried hard, there is no danger of the cover being rubbed off, but slides to be put on the market are usually "ringed" as already described. It is often thought necessary to bring out certain structures in the section by staining it with one or more dyes before it is permanently mounted.

Sometimes the material is too thin or delicate to be cut in carrot, and it may be necessary to embed it in some substance like celloidin which can be hardened round it, cut with it and dissolved away from the section when this has been made. Celloidin may be also used to keep certain parts in their relative positions before and after they are cut, as in the case of the bud of a flower in one of our illustrations. Certain structures may be cut between the fingers with or without the help of carrot or elder pith. The skin of the leaf seen in the illustration on page 621 was probably sliced from material wrapped round the forefinger. A very successful slide made by Mr. Cole is one showing the pollen grains of the lily sending down their tubes into the stigma of the flower



THE MICROTOME

Designed by Mr. Cole for cutting sections of material embedded in carrot

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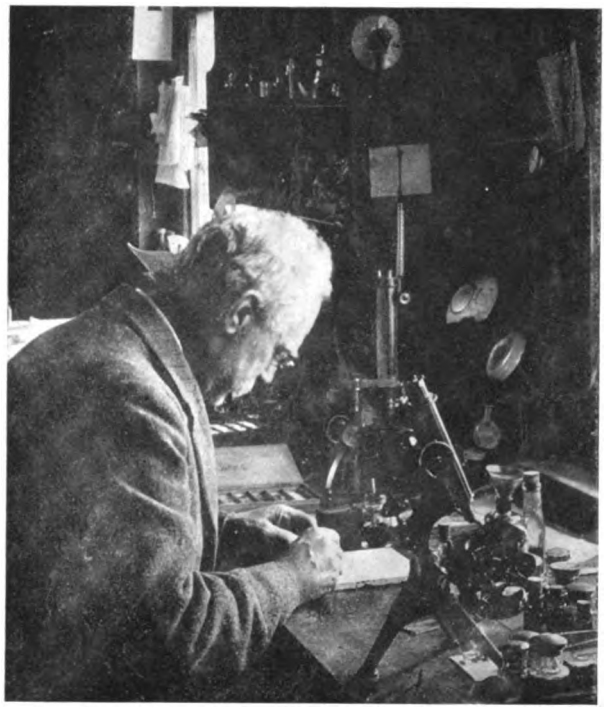


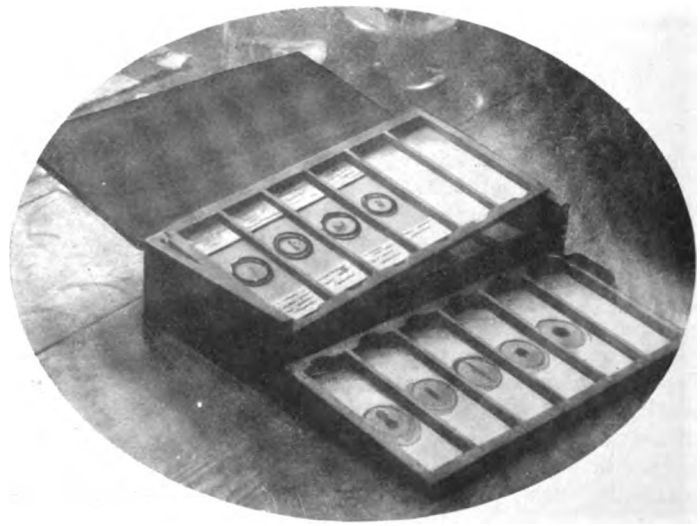
MR. COLE MAKING A MICRO-SLIDE

which will carry down the nuclei of the grains to the eggs in the ovary below, and bring about fertilisation.

Similarly on the zoological side, Mr. Cole caters chiefly for students. Occasionally he may mount animals whole when their size admits of it, as in the case of the young brittle starfish or the freshwater polyp. The cutting of animal tissues, however, is not quite such a simple matter as that of slicing up stems and roots, for muscle and connective tissue are more refractory under the knife. A general way is to freeze the pieces of tissue on a special microtome by means of an ether spray which solidifies a solution of gum placed round the object. Another way is to embed the material in melted paraffin wax, and if the small resulting block is placed in one of the many automatic microtomes, the edges of the paraffin round each section adhere to those of the one in front and behind so that a long ribbon is formed in which the sections are arranged in their proper order. It is possible by this means to examine every thousandth part of an inch of a small creature, and it has been scornfully said of the laboratory naturalists who were common a year or two ago that they might know every fraction of a creature as it appeared in section under the microscope, and yet fail to recognise it if they met it in the field. Dove-tailing into the zoological work is that done for the benefit of the medical student who has to study the microscopical anatomy or histology not only of certain animals but more particularly of man.

Though many of the resulting sections are exceedingly fine, there is rather a gruesome aspect about the bottles of material, or rather, one should say, their labels in some cases, for these bear the names of the individuals whose

A MICRO-SLIDE



A BOX OF MICRO-SLIDES

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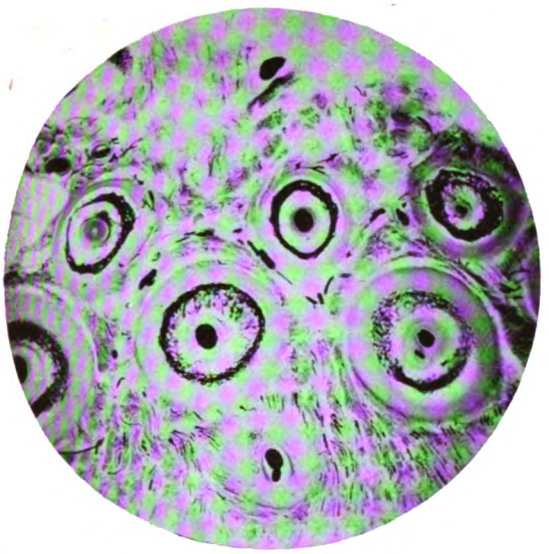
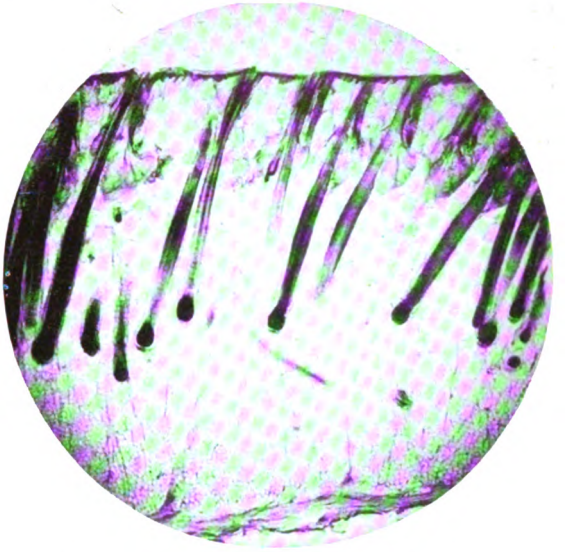


A SECTION ACROSS THE BASES OF A CAT'S WHISKERS

To show the structure of tactile hair

Photo by Fred Noad Clark



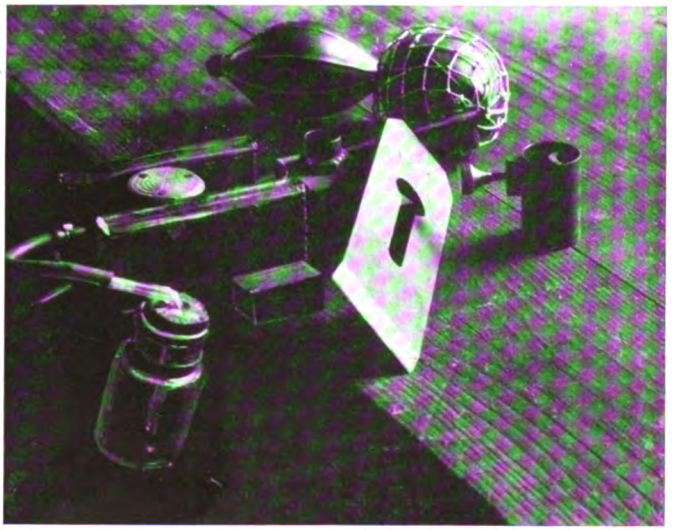
A LONGITUDINAL SECTION THROUGH THE HUMAN SCALP

Showing the roots of the hairs and the layers of the skin. Magnified nine times

Photo by Fred Noad Clark

bodies at one time or another have found their way into the London dissecting-rooms. It should be said also that Mr. Cole's help is often invited by well-known surgeons who require sections of diseased tissues which have been taken from their patients so that their cases may be diagnosed with more certainty.

All manner of commercial products find their way into the laboratory. At one time it may be a specimen of some particular timber of which a section is required. At another time a series of mantles for incandescent gas burners taxes Mr. Cole's manipulative skill to the utmost. On one occasion a large quantity of earth arrived with the request that some special germ should be found and mounted, but as to do this would require all the apparatus and special methods of the bacteriologist, who would have to cultivate all the germs present and in the end isolate the one required, Mr. Cole did not fulfil the request of the sender. One important branch of microscopical work is the taking of photographs through the instrument so that magnified pictures of the various objects are obtained. Some workers make a speciality of this, and it is obvious that the business man who does not possess a microscope or is not familiar with its use, would like to have the results of an investigation in black and white. One photo-micrographer with whom the writer is acquainted had an interesting though difficult task allotted to him. It comprised not only the making of illustrations of a number of tiny diamonds, but also of the magnified scratches made by them.



THE FREEZING MICROTOME

Used for cutting animal tissues

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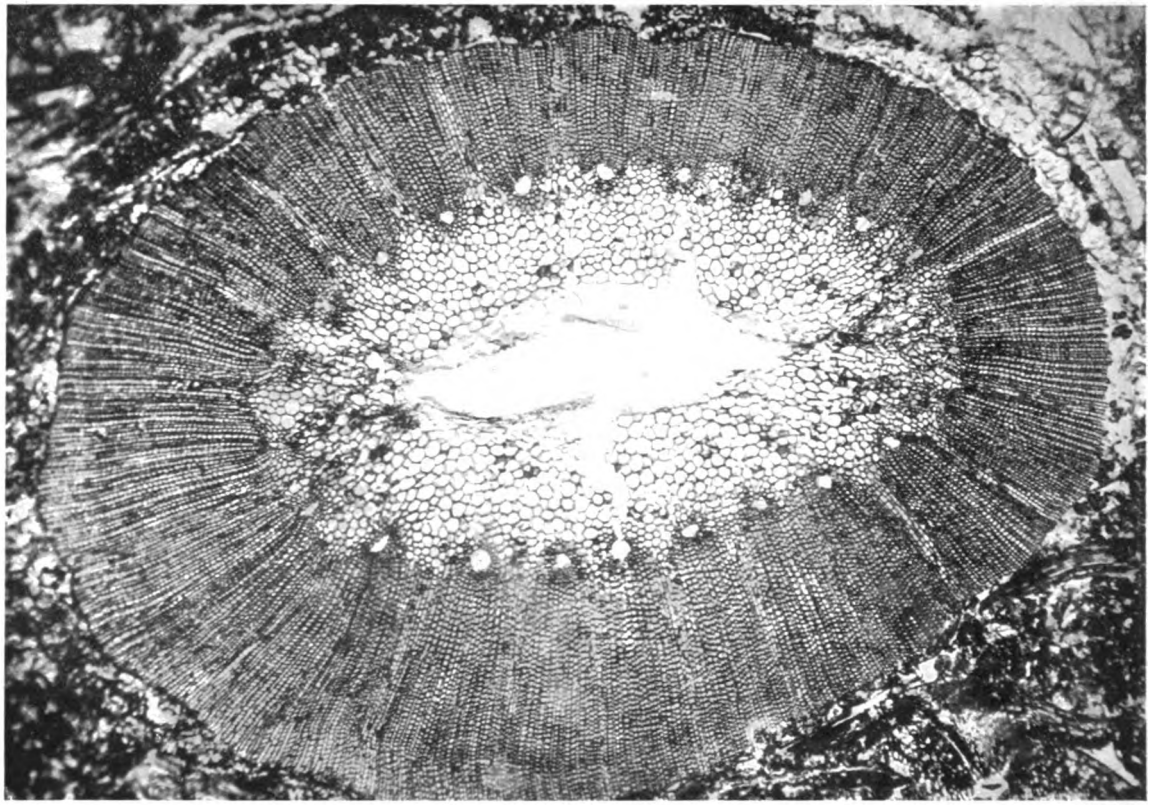
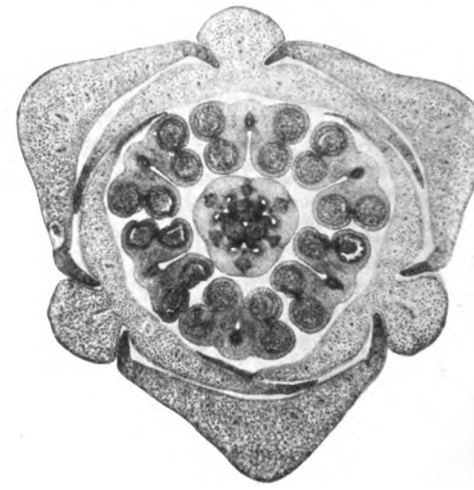


Photograph by James Lomax

A CROSS-SECTION OF THE STEM OF A CALAMITE, MAGNIFIED

Up to the present we have said nothing of the cutting of hard substances such as rocks and the fossils contained in them, but slices often less than the two-thousandth part of an inch in thickness can be made. In this case the cutting instrument is a thin revolving disc of soft iron used with diamond dust, which becoming embedded in the metal edge enables the disc to cut its way through the hardest substance. An interesting branch of this work carried on by Mr. James Lomax of Great Lever, Bolton, deals with the fossils of the Lower Coal Measures; and by the examination of them by botanists, including Professor Oliver and Dr. Scott, the origin of some of our modern plants has been traced. Apart from their use for original research and for teaching purposes, these sections of fossil plants are used in museums to illustrate their structure and the natural history of coal. From the figure which we owe to the courtesy of Mr. Lomax, even those who are not familiar with the microscopical anatomy of recent plants will recognise the great amount of detail which can be seen and portrayed.

We may pass over the use of the microscope for determining the origin of blood stains and for detecting adulterations in food and other



THE SECTION OF A LILY BUD

Magnified eight times

Photo by Fred Noad Clark

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things. The whole science of bacteriology and the discovery of disease germs is dependent upon the microscope, but except when sections are needed showing bacilli *in situ* in the tissues the help of the microtomist is not required, for the bacteriologist finds that the mounting of his specimens when he has once obtained a pure culture is the easiest part of his work.

In passing, we may just say that modern dairying and brewing, to mention no other industries, are indebted to the microscope to a tremendous extent. In the Colonies, wools are examined microscopically instead of by rule of thumb methods. Agriculture also in Europe has gained greatly from a knowledge of soil bacteria and the organisms living in the nodules on the roots of members of the pea family, enabling the latter to use nitrogen obtained from the air instead of from the soil.

In conclusion a word may be said with regard to fancy mounting, by which one means the arrangement of diatoms and foraminifera in ornamental patterns: the making of microscopic baskets from the tiny and many hued scales of butterflies which delight the hearts of amateur microscopists and visitors to such conversaziones as we alluded to at the beginning of the article. The reducing of photographs to such an extent that they cannot be seen without a microscope may be considered at this point, as well as the extremely minute writing on slides with a diamond which some few individuals have been able to do. The most celebrated of these was a namesake of the present writer. He was a hunchback through an injury, and he had been told that he would only live for a certain number of years. This idea became so fixed on his mind that he used to urge Messrs. Watson and Sons, the opticians, to take as many slides as possible, as he had only just so long to live. On the day before the last year allowed him was completed he betook himself to a hospital without saying anything to his wife, went to bed, and the next day he was dead, though previously he was apparently as well in health as he had been for many years.

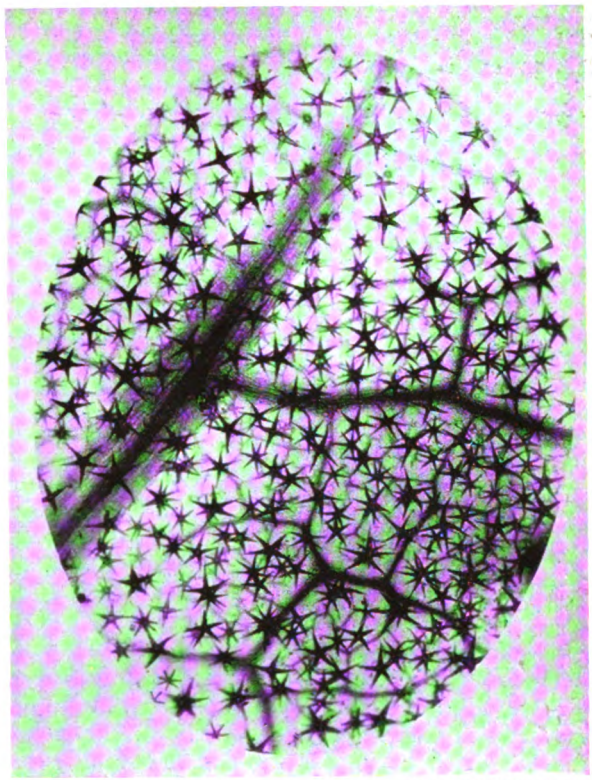

Photo by Fred Noad Clark

THE HAIRS ON A DEUTZIA LEAF

Magnified thirty times

AN ADJUNCT TO THE MICROSCOPE

HITHERTO IT HAS BEEN DIFFICULT TO COMPARE OBJECTS ON DIFFERENT SLIDES—THIS CAN NOW BE DONE SIMPLY BY THE COMPARASCOPE, A NEW INSTRUMENT WHICH CAN BE FIXED TO ANY MICROSCOPE

TO make the work of investigation easier is to increase the capacity of output of a large and important section of the world's workers, and thus it is worth while to draw attention to a new invention, which will probably prove to be an almost indispensable adjunct to the laboratory microscope. It has hitherto been a tedious and somewhat difficult task to compare objects on different slides, and the methods open even to the possessor of more than one instrument have not been altogether satisfactory. The substitution of one slide for another, the use of duplicate microscopes, the aid of photography

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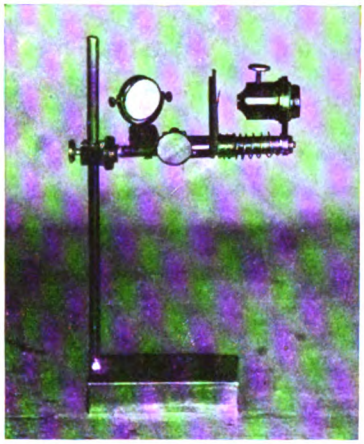
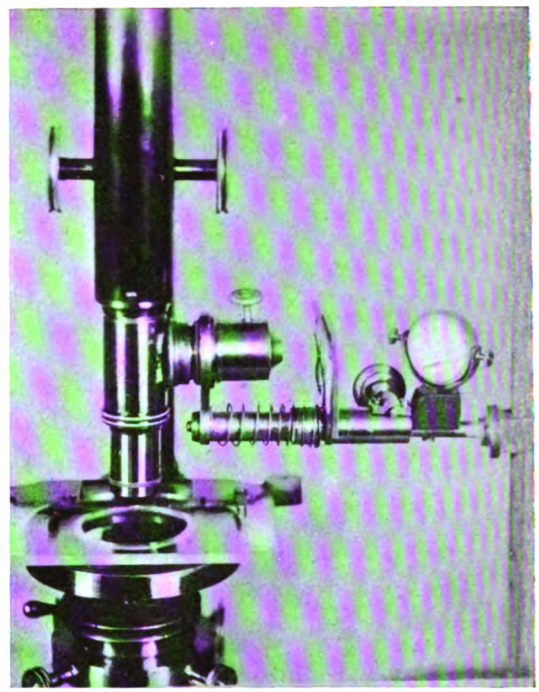
are all open to objections either on account of their unsatisfactory character or because of the labour entailed; and the new method, like many another discovery, is the outcome of the actual necessities of the inventor himself. Mr. D. Finlayson, F.L.S., a well-known seed analyst of Wood Green Laboratory, carrying out a series of difficult investigations into starches, fibres, and feeding materials, became painfully conscious of the deficiencies of the methods of comparison which he was compelled to adopt, and, in conjunction with Mr. Ashe, a well-known microscopist, he at length lighted upon the idea which, taking form in the Ashe-Finlayson Comparascope, has lightened his own labours considerably, and will be welcomed by many thousands of investigators all over the world. Not the least merits of the Comparascope are its absolute simplicity and the fact that it is adaptable to any existing microscope without impairing the efficiency of the latter for use in the ordinary way; and the object attained is the presenting to the observer of two objects (on any two slides which it is desired to compare) in the same field of vision. The two objects appear side by side, and comparison is thus immeasurably easier than hitherto, while likely to be far more accurate.

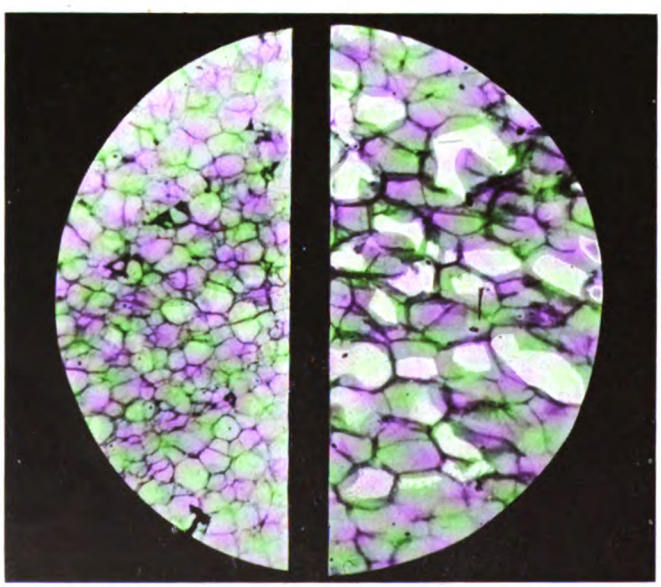


THE ASHE-FINLAYSON COMPARASCOPE



COMPARASCOPE AFFIXED TO MICROSCOPE

The instrument is simply affixed to the nose-piece of the microscope. The second slide is placed on the horizontal bar, at one end of which is the objective and at the other end a mirror. In the tube fitting on the nose-piece of the microscope is fixed a reflector, and by means of this the rays of light passing through the second slide are deflected up the tube of the microscope. To prevent the superimposition of the two objects which would otherwise follow, the tube of the microscope itself is divided by a removable plate into two equal parts, and as a result the two objects which it is desired to compare are seen side by side.



MANGELS

THE TWO OBJECTS ON SEPARATE SIDES, AS SEEN BY THE COMPARASCOPE

HIGH-FEEDING QUALITY LOW-FEEDING QUALITY

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MOUNTING BIG ANIMALS

SOME RECENT REMARKABLE TAXIDERMIC FEATS—MOUNTING THE WORLD'S BIGGEST RHINOCEROS, GORILLA, SEA ELEPHANT AND SIBERIAN MAMMOTH—DIFFICULTIES OF THE WORK AND THE MANY QUALIFICATIONS DEMANDED OF THE SUCCESSFUL TAXIDERMIST

BY

HAROLD J. SHEPSTONE

IT is no exaggeration to say that the work of the modern taxidermist does not receive that favour among the artistic profession it deserves. Painters and sculptors are apt to class taxidermy with the trades, whereas the successful mounter of animals may be described as a painter, sculptor, modeller, carpenter and blacksmith all in one.

Curiously enough, the art—for taxidermy is an art—has been severely taxed of late; both in Europe and America a number of rare, large animals have received the attention of the taxidermists, and an inspection and description of their work undoubtedly reveals the fact that the mounting of the bigger beasts is one which only qualified men can undertake with any degree of success. Take, for instance, the case of the gigantic rhinoceros recently added to the National Museum at Washington. It represents the work of Mr. David N. McCadden, chief taxidermist of the Academy of Natural Sciences of Philadelphia. When alive the great animal weighed three tons. It took a truck and four horses to bring him from the zoo to the academy, where he was at once attacked by the taxidermists and skinned. Pete, for that was the animal's name, died of cancer at the Philadelphia Zoo, and as he was the largest rhinoceros in captivity in the United States, if not in the world, it was decided that his skin should be preserved in the National Museum.

It took more than two weeks to skin the great animal, gallons of embalming fluid being injected into the veins in the meantime to preserve the mass of flesh from decomposition. The hide of the monster was found in places to

A GREAT SEAL ELEPHANT

The animal is now very rare. This magnificent specimen (the largest ever mounted) is now in Berlin. Alive it would weigh 4½ tons

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THE MOUNTED GORILLA IN THE HON. WALTER ROTHSCHILD'S MUSEUM AT TRING

The largest gorilla ever shot

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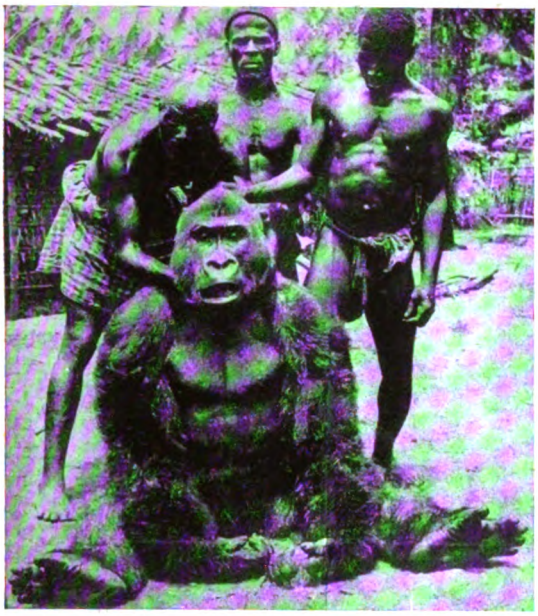


THE GORILLA AT THE TRING MUSEUM

From a photograph taken immediately it was shot in Central Africa

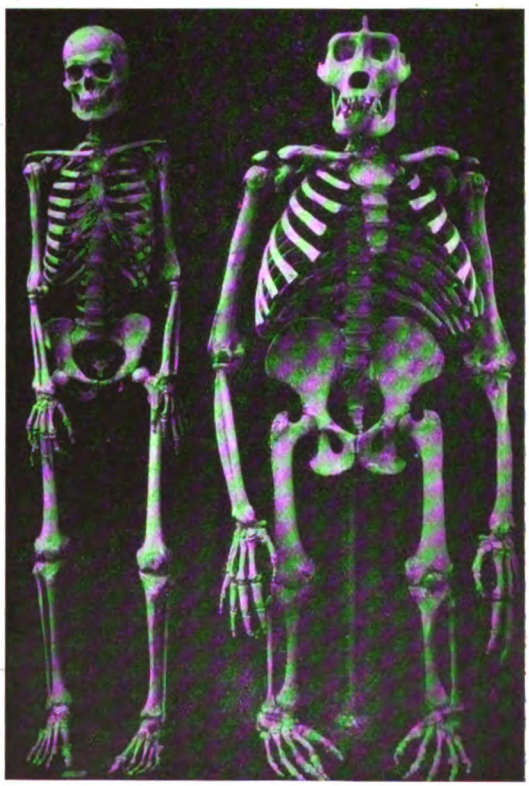
be three inches in thickness, requiring the combined strength of six men, with a number of mechanical contrivances, to disengage it from the flesh. Only by cutting the skin in three sections could it be removed. It was then sent to one of the largest tanneries in Philadelphia; the process of tanning occupied two months, as many as fifty men handling it at different stages.

Before the animal was skinned Mr. McCadden took over a hundred measurements of the body, which were carefully recorded for future reference. The bones, with as little muscle on them as possible, were placed in a large tank containing pure water, where they were left for months to macerate, coming out as pure and white as ivory. The hind legs of the animal measured each six feet in length, and weighed 100 pounds.

The real labour in connection with the mounting of the rhinoceros was that involved in building a suitable framework, or "manikin," to receive the skin. To accomplish this a large iron framework was forged and bolted to a stout platform; around the ironwork was built a wooden skeleton, conforming roughly to the general shape of the rhinoceros. This, when completed, was padded with excelsior and tightly wound round with brass wire. On top of the excelsior was laid a thick layer of modelling clay. This latter was a close copy of the real animal, on a slightly smaller scale, to ensure a perfect fit of the huge skin. Some 500 pounds of iron, 250 square feet of timber, 300 pounds of excelsior, and 800 pounds of modelling clay were requisitioned to complete the structure. When dry the skin weighed about 800 pounds, making a total of 2400 pounds, or probably, with the addition of other material not counted in, a trifle over a ton and a half.

When the skin was stretched and stitched on the clay model the task was by no means finished. The stuffed animal did not have the appearance of the animal in real life. A *papier-mâché* tusk was made, as Pete had rubbed his own off on the iron bars of his cage. The ears, which drooped, were stretched into proper shape, and given a forward alertness by means of thin sheets of lead inserted from the inside. Finally, the body was tinted with several coats of filler, and ten pounds of pigment afterwards applied.

The work occupied exactly nine months, and many experts expressed surprise at the



MAN AND GORILLA

The skeleton of the gorilla in the Tring Museum compared with that of a man

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quickness with which the contract had been carried out. Yet it must not be forgotten that only one animal was treated, nor was there any attempt to produce any particular pose, but just a lifelike presentation of how the rhinoceros appeared when alive. Supposing it had been decided to mount a group of those animals, say two full-grown ones and a baby, with a pretty natural background in the way of a river's bank. It is not difficult to see that the labour would have been prodigious, and

ROCKY MOUNTAIN GOAT GROUP
Mounted by William Palmer, a noted taxidermist

instead of nine months we should probably find the taxidermist as busy as ever after the lapse of twice that period. Indeed, Mr. W. T. Hornaday, the director of the Bronx Park in New York, which can claim the distinction of being the largest zoological garden in the world, has frequently spent from two to three years on one single set-piece. He was one of the first of modern taxidermists to mount large animals in groups, and when he decided to superintend the erection of the great zoological park in New York the taxidermic profession lost one of its greatest masters.

It is not necessary to go to the American museums to see artistic specimens of the taxidermist's art. You can see them at our own great museums and in private collections. The Hon. Walter Rothschild, admitted to be one of the greatest zoologists of the present day, has several fine examples of taxidermy work in his museum at Tring. One of the most interesting, perhaps, to the ordinary visitor is the magnificent mounted gorilla, the largest ever shot. It is without question the finest mounted specimen of the big ape in Europe.

This giant beast was shot in Central Africa by a German hunter, Mr. H. Paschen. While shooting in Yaunde, in the Cameroons, a German possession in Equatorial West Africa, he was informed by several natives of Tsonu-town that a "big monkey" was in the neighbourhood, of whom they appeared in awe. Mr. Paschen subsequently set out to find the "monkey," accompanied by some seventy-one natives. After about fifteen minutes' walk they came to a dense and swampy thicket, where the native said the beast was hidden. At last the animal was discovered hiding in a tree, so situated that no one could get at him.

The daring hunter at once took out his bush-knife, and after considerable trouble managed to cut a path to the foot of the tree. His curiosity aroused, the gorilla looked down through the leaves, but at that moment Mr. Paschen's gun was heard, and the huge beast received an ugly wound in the jaw. It fell head first out of its perch, and caught hold of the branches before it reached the bottom. But a second shot, well directed, brought the monster to the ground at the very feet of the slayer. It was not only a giant, but a magnificent specimen of its class. The skin was beautiful and the teeth perfect. Twelve men carried it back to the village—no easy task, as the monster turned the scale at about 500 pounds.

After taking a snapshot of the gorilla Mr. Paschen had it skinned. This and the beast's bones were embalmed, sent to Europe, and subsequently mounted in Hamburg at Mr. J. F. G. Umlauff's ethnological museum by Mr. Willy Umlauff, after four months of incessant work. When in Hamburg recently the writer paid a visit to this famous establishment, and was introduced to the man who

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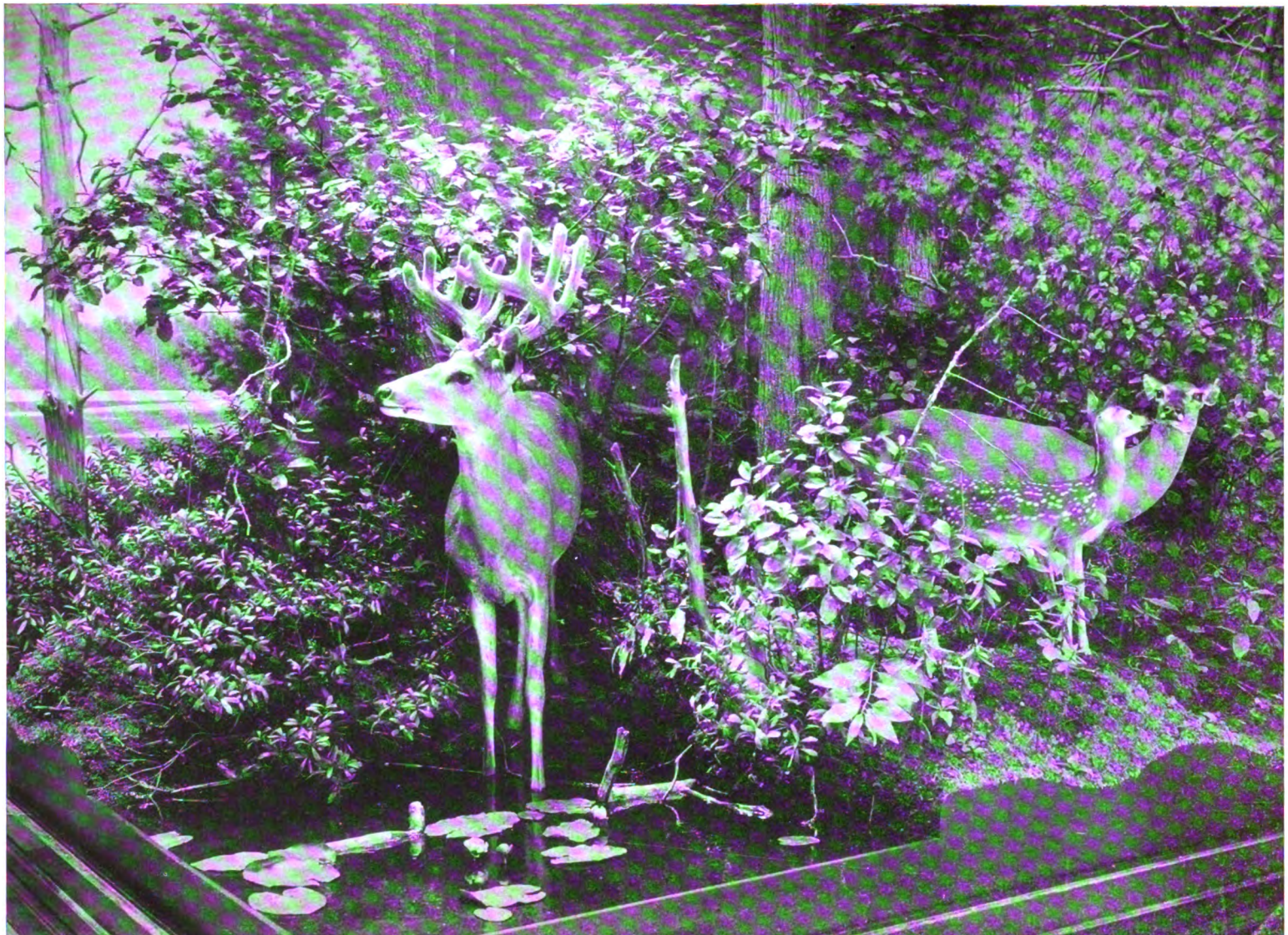

THE AMERICAN RED DEER—"SUMMER"

A fine example of the taxidermist's art

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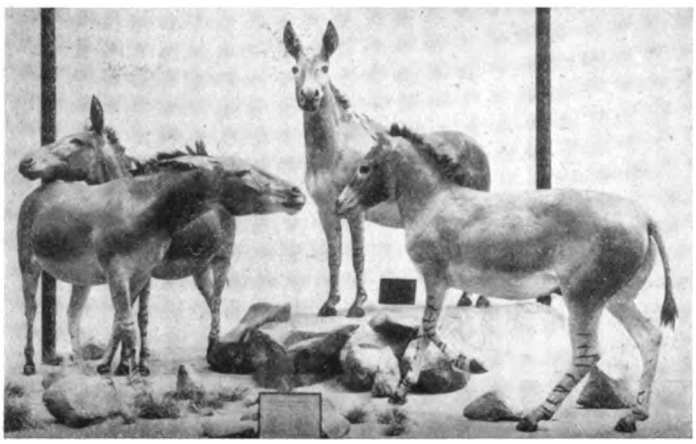
stuffed and mounted the finest and largest specimen of the ape that has ever been killed.

First of all the taxidermist made a model in clay, which he used to guide him in mounting the great beast. To describe this labour in detail is not necessary here, the processes being somewhat similar to those adopted in mounting the rhinoceros, already mentioned. Numerous



WILD ASSES OF SOMALILAND
A life-like piece of taxidermic work

measurements had to be taken, of course, and the skin tanned. The real labour in connection with the mounting was that involved in building a suitable framework, or "manikin," to receive the skin. To accomplish this a wooden skeleton was made and firmly bolted to a stout platform. This was padded with excelsior, on top of which was laid a thick layer of modelling clay. This latter was a close copy of the real animal, on a slightly smaller scale, to ensure a perfect fit of the huge skin. After the gorilla had been mounted it was purchased by the Hon. Walter Rothschild for his natural history museum at Tring. It is one of the principal objects in that museum. The huge beast stands five feet five inches high and measures over eight feet from finger to finger.

Another famous taxidermic feat by this same firm was the dressing and mounting of a monster sea elephant, the largest animal of its kind ever killed. It was found some eighteen months ago by whalers off the coast of the Falkland Islands. They promptly surrounded it and subsequently slaughtered it. The next procedure was to skin the monster, and the hide and raw skeleton were purchased by Mr. Umlauff. He at once began the difficult task of mounting the giant. It occupied him six months. A laborious piece of work was the removing of the fatty matter from the skin, which was entirely permeated by blubber-canals. Before the animal was finally dressed a model was made, and as good pictorial representations of the sea elephant are scarce, the artist had very little material to guide him.

Some idea of the size of the monster may be gauged from the fact that from the tip of its tail to the tip of its tusk it has a total measurement of nearly 21 ft. Such an animal when alive, would weigh 10,000 pounds, or say 4½ tons. The circumference of the body at its widest part is some 18 ft. The skull alone measures 2 ft. 3 in. long and 1 ft. 3 in. high. The mounted specimen is now on view in the Berlin Zoological Gardens.

The sea elephant, or seal elephant, is now very rare. Formerly they were found in large numbers in the Antarctic Ocean. Even old experienced whalers who have seen the one recently mounted declare they have never met a larger specimen. It has derived the title elephant from the fact that it possesses a kind of trunk, or proboscis. This characteristic is only found, however, in the old males. It extends quite a foot beyond the angle of the mouth. In other respects, also, the males are distinguished from the females, more especially by their size. The female, on the average, attains only half of the length attained by the males, and only one-third the weight.

The ungrudging labour spent by the modern taxidermist in obtaining a faithful representation of the animal he attempts to preserve, and its surroundings, is well illustrated by the four groups of American red deer recently set up for the Field Columbian Museum, Chicago, by Mr. Carl E. Akeley, the taxidermist of that institution. They are beautifully done and depict a red deer family during one year of its woodland life—in spring, in summer, in autumn and in winter. We reproduce photographs of two of these groups—depicting Summer and Winter. The contrast is remarkable. In the summer scene are shown four red deer in the coat of that season—the old buck with his horns still in the "velvet"; the old doe caring for her spotted coated fawn, and in the background, just showing his head from beneath the branches, is the yearling buck,

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THE AMERICAN RED DEER—"WINTER"

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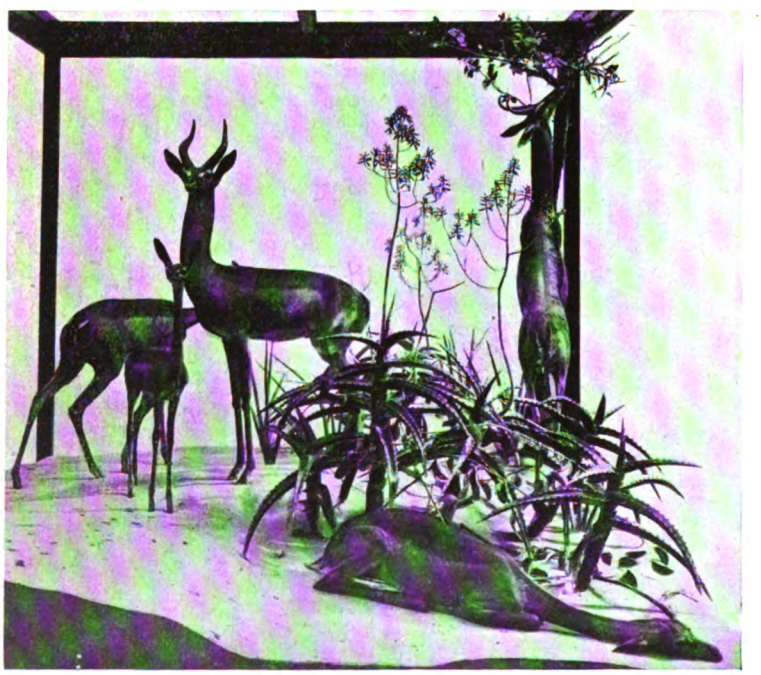
proud of his first antler growth, though it consists of nothing more than two rudimentary prongs. The placement of the animals is decidedly picturesque. They are depicted as if at the edge of a woodland lake. The old buck is standing in the water. He is taking a look at his surroundings before beginning to feed on the roots and pads of the water-lilies at the lake's edge.

With the exception of the large tree-trunks, all the vegetation in this scene is artificial. Yet it must be admitted that it has not that appearance. Each stalk is built up by comparison with one of nature's own, and through it runs metal tubing to give it stability. The leaves are of wax, copied from nature with infinite painstaking. When it is said that there are over 17,000 leaves in this one set-piece, some idea is obtained of the immensity of the work.

Then take the winter picture. In this the deer are seen clad in their heavy winter garments.



THE SOMALILAND GAZELLE
An exquisite taxidermic group

The fawn, now well grown, is reclining in a bed of snow. The old doe is reaching for lungwort, an edible bit of which she is fond, and which grows on the bark of the birch. The young buck is after ground hemlock beneath the surface of the snow. Two Canadian jays, or whisky-jacks as the lumbermen call them, give additional life to the scene. One perched near the browsing buck is curiously watching to see what he will turn up from beneath the snow. The other jay is at the right of the patriarch of the deer family.

The snow, which weighs down the branches of the trees, forms grotesque caps for the stumps and makes a white carpet for the woods, is not snow, but sugar. The counterfeit is perfect, however, and as one looks back seemingly into the depths of the forest there is the same sparkling resemblance of a snow-fall. One is not surprised to learn that a faithful study of the surroundings of these animals in the different seasons was made before the artist began his task of grouping the deer. The four pieces represent many months of patient labour, but the result is decidedly charming. Such work as this goes to prove the writer's opening statement that modern taxidermy is an art, and not merely the "stuffing" of an animal, the putting-in of glass eyes, and the insertion of a few metal rods to give to leg and neck a stiffness that nature never knew.

One has to go to St. Petersburg to discover the biggest animal ever mounted—namely, a Siberian mammoth in the Zoological Museum of the Academy of Sciences in that city. The great beast was discovered by a Cossack, named Jawlowsky, in the summer of 1901, on the banks of the Beresowka, an affluent of the Kolyma, in latitude 67 deg. 32 min., a remote part of North-Eastern Siberia. The find was reported to St. Petersburg and Dr. Otto Herz, of the Imperial Museum, was despatched to secure the body entire. To accomplish this he was given a company of Cossack troopers and fifty horses for transport. After a tremendous journey over trackless mountains and swamps they reached the spot, but, says Dr. Herz, "We were at a loss to proceed further, for the maps of the district are not detailed, and we found ourselves in the midst of a vast district of exactly similar ice-mounds. Finally, however, my nostrils detected a

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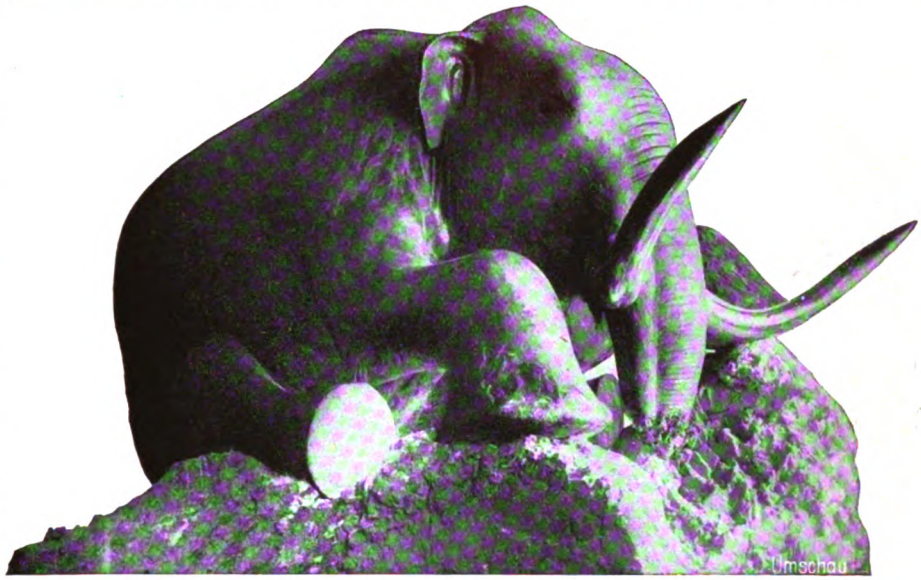
strange odour, and it occurred to me that it might be the flesh of the monster we were seeking. By dint of walking in the direction whence the smell seemed to come, I finally located the mammoth. In my excitement I ran the last mile of the way against a fast-increasing stench. At the spot I found a faithful Cossack, who for fifty days had stood guard over the carcass at the command of his superior officer. He had covered it entirely over with dry soil to a depth of three feet, but even through this protection the smell made its way."

The mammoth had evidently fallen into a hole, his plunge having no doubt caused masses of neighbouring soil to loosen and cover him over completely. Water then poured into the grave, became frozen, thus preserving the great animal as if he were in a cold-storage chamber. In this way the enormous carcass was preserved, for how long no one knows—centuries perhaps—until some years ago a movement of the earth spat forth the fossil mausoleum, leaving it exposed to the sun and wind; and gradually the ice crust wore off and revealed to the passing Cossack the long-hidden treasure. Dr. Herz soon saw that the huge beast was in a remarkable state of preservation. The proboscis and other soft parts of the head had been eaten away by carnivorous animals, while only one tusk remained. With the exception of this the mammoth was absolutely complete. The most delicately soft parts of the animal had been wonderfully preserved, and considerable anxiety was experienced in preventing the tissues from putrefying when taken out. Dr. Herz thinks that the mammoth was quietly browsing on grass-land which formed the thin covering of a glacier, that a crevasse in this ice was obscured by the soil, and that the heavy animal accidentally fell through.

The feat of removing the skin was no easy one. Huge quantities of disinfectants had to be poured over the animal to reduce the stench and make it possible for the doctor and his assistants to take measurements and superintend the work. At last this section



THE SIBERIAN MAMMOTH IN THE ZOOLOGICAL MUSEUM AT ST. PETERSBURG

The mounting of this prehistoric monster was the biggest taxidermic feat ever undertaken

of the undertaking was accomplished, when the flesh had to be cut away, all the bones removed, washed, cleaned, chemically treated and carefully packed ready for transportation. It was also decided to preserve certain portions of the flesh, which was treated with arsenic and then sewn up in huge cowhide bags in a frozen state. After this work was finished the remains of the mammoth had to be dragged on sledges and floated on rafts for 3000 miles before the Siberian railway was reached, when train was taken to the Russian capital. Arriving there, the great task of mounting the mammoth was commenced in earnest, and our photograph depicts the prehistoric beast as it now appears in the museum at St. Petersburg. It is mounted in the attitude in which it met its death. The skeleton has been preserved and mounted separately, and is wonderfully complete. The skin had lost much of its hair, but some of this has now been restored from other specimens in the museum. The hair on this giant has an average length of seven inches, while the yellow wool under it is from five to ten centimetres thick. The animal is a young male, and not remarkable, so far as the mammoth is concerned, for its size. It is nevertheless a very valuable acquisition to the world's natural history specimens.

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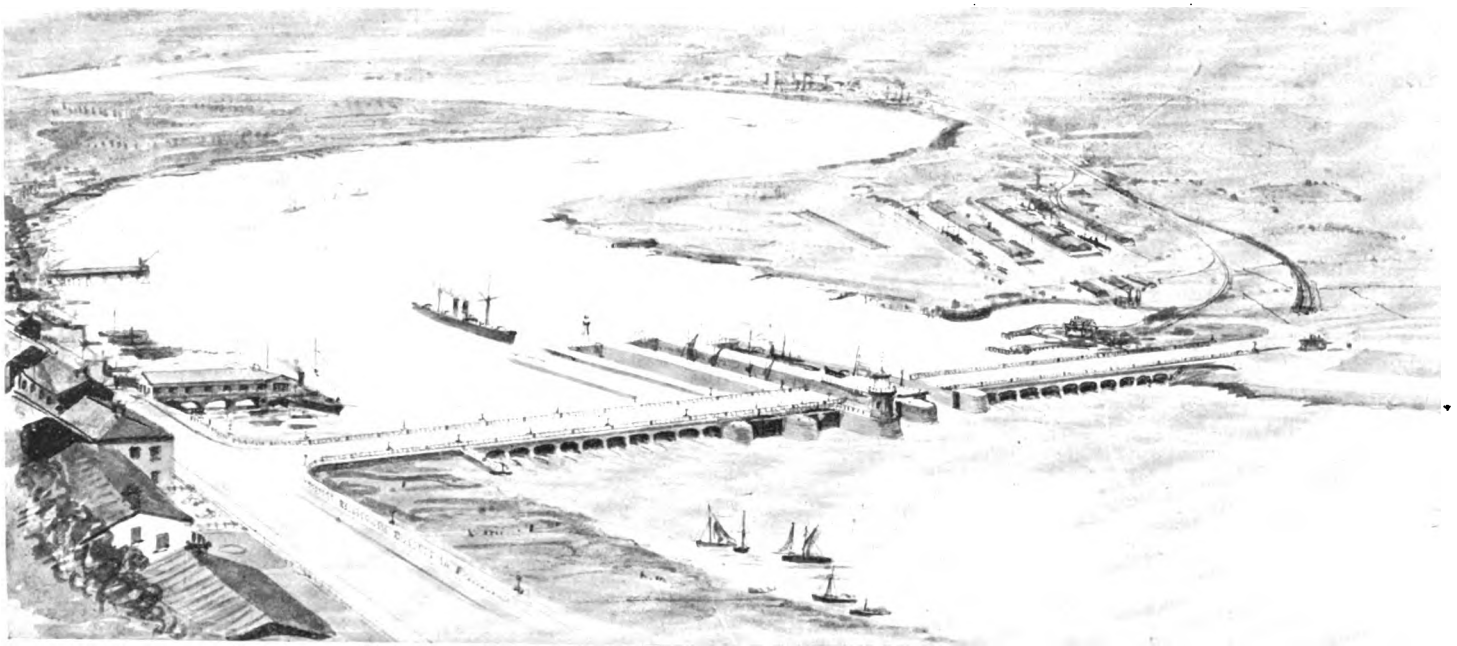

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VIEW OF THE PROPOSED BARRAGE AT GRAVESEND AS IT WILL APPEAR WHEN COMPLETED

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A GREAT THAMES BARRAGE

SOLVING THE GRAVE DEFECTS OF THE PORT OF LONDON—FOR THE CONVENIENCE OF TRADE, AND TO SAVE TIME TO THE SHIPPING—THE BARRAGE PROJECT EXPLAINED—OBJECTIONS FROM THE DOCK COMPANIES—WHAT IS NOW REQUIRED

BY

CHARLES E. D. BLACK

IT is undeniably disappointing that the reform of the Port of London, which is by general consent so crying a want, should be shelved. In 1900 a Royal Commission was appointed amid signs of universal approval to inquire and report on the whole question. The interests were intricate, multifarious and weighty, and obviously nothing but a Government investigation would meet the case. And the Report which appeared two years later was not only a unanimous production, but elicited on the whole very general agreement and commendation.

But delay has evolved its usual disintegrating forces, and the recommendations of the Royal Commission at present stand discredited. What were these recommendations? They were that the docks should be purchased outright at a cost of something like thirty millions, and that the river should be dredged to a considerable depth at a cost of two and a half millions sterling. There was also the paramount proviso that a consolidated port authority should be created to overtake all the administrative harbour business. The latter is indeed an urgent and essential need, whatever its eventual policy or programme may be.

But the purchase of the docks and the feasibility, if not the possibility, of dredging the bed of the Thames to the extent contemplated is beginning to be more and more questioned. And not least because of the increasing favour with which the alternative project of constructing a dam at Gravesend is beginning to be regarded. A dam or weir is no new thing on the Thames. There are forty-six of them, with locks, for the accommodation of the traffic, between Richmond and Thames Head. The question is whether one more weir, dam or barrage—but the largest and most important of all—would help to solve the admitted grave defects of the Port of London? These may roughly be summed up as: (*a*) Insufficient depth of water in the river for the increasing size and draught of latter-day ships. (*b*) Tide-waiting and costly detention at Gravesend and at the dock entrances, inward and outward. (*c*) Excessive and unsatisfactory dues. (*d*) The inconvenience to trade caused by conflicting and overlapping authorities. (*e*) Excessive cost of barging, pilotage, and labour in loading and discharging. (*f*) Dangerous navigation due to tides, awkward bends in the river, narrow channel, fogs, and the crowded state of the river; and last, but not least, (*g*) excessive delays in clearing, delivery, and shipment. This last head is indeed the great and notorious drawback attaching to the Port of London, and the Royal Commission made it abundantly clear that unless real reform was instituted there was grave danger of the trade of London being increasingly diverted to rival ports, to say nothing of foreign countries.

The promoters of the Thames barrage project propose to construct a dam across the river at Gravesend, somewhat similar, though of course considerably smaller than that across the Nile, containing numerous adjustable sluices as well as four or six large locks to admit the passing traffic, up and down stream.

Such a dam would hold up the river to about the level of Trinity high-water level, and thus convert the whole river from Gravesend to Teddington into one large lake with numerous affluents, the principal being the natural flow of the main stream over Teddington weir.

All tides would be stopped at the dam. But it would be a mistake to assume that the waters of the so-called lake would be stagnant. There would be a slow downward current, and the mischievous effect of the oscillating foul water kept in suspension by the flux and reflux of the tide would be abolished for once and for ever. People talk about the natural scour

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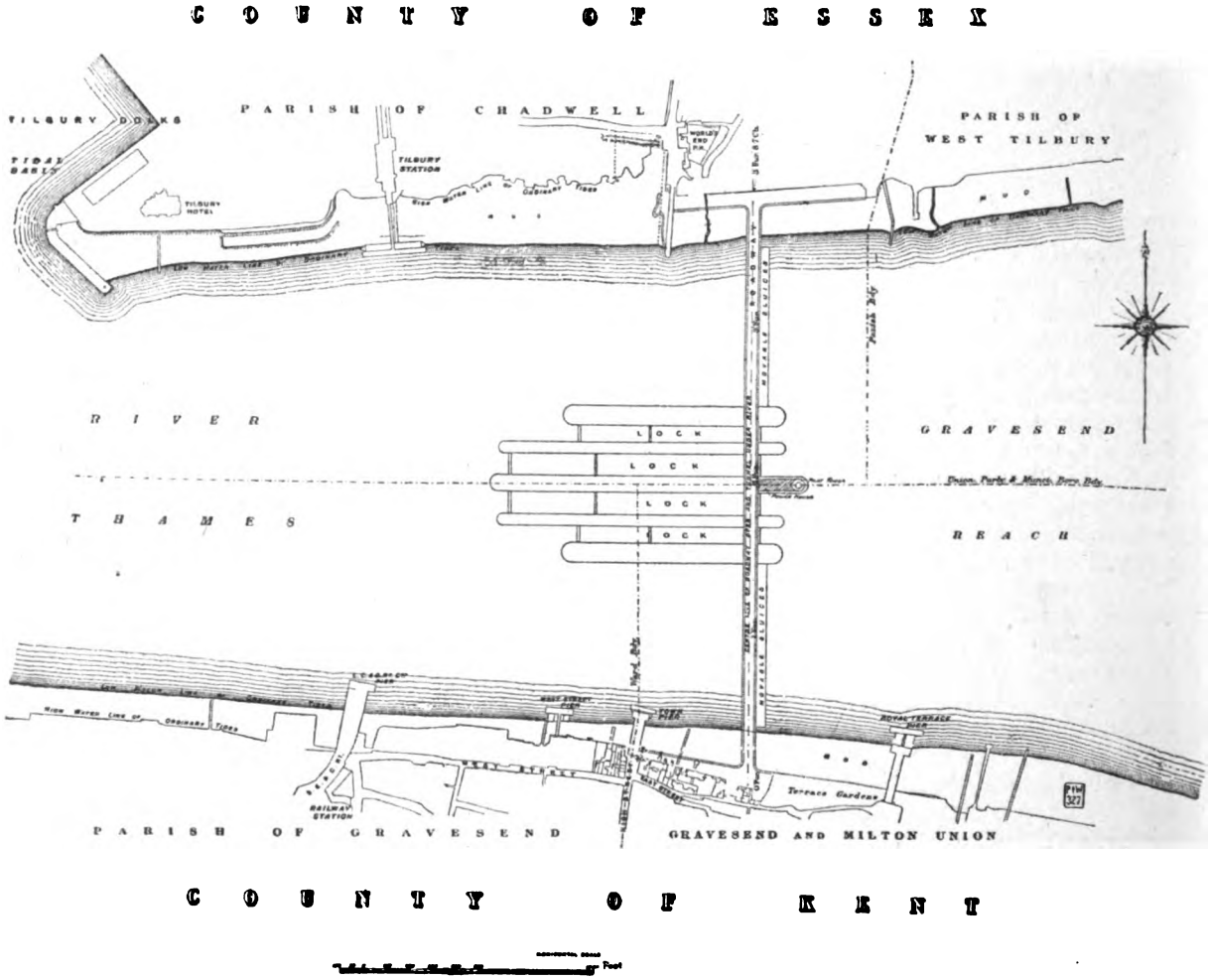
of the river, forgetting too often that the influence of the tide, which is exerted most powerfully in the reverse direction, leads to a prolonged suspension for over a month of the discharged soilage. Once the dam is constructed, the flow of the upland water, being continuous, will gradually push over the weir the foul water previously in suspension, and thenceforward the water of the Port "lake" will be the same as that of the upper river.

So much for the *prima facie* effect above the barrage. But the result from the navigator's point of view will be to increase enormously the capacity of the river. A navigable depth of water, varying from 65 ft. at Gravesend to 32 ft. at London Bridge, will be obtained by one work of comparatively simple construction and moderate cost as contrasted with the enormous expense of buying up the docks of London.

The very largest ships will then be able to proceed, at any hour of the day or night, without being dependent on the tides, as high up as London Bridge.



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A GENERAL PLAN SHOWING THE BARRAGE IN RELATION TO TILBURY AND GRAVESEND SHORES

Or if they need not go so high up, they can anchor almost anywhere, lie alongside any wharf or quay, remaining always at the same level, an enormous convenience to shippers, wharfingers, and others. The full width of the river will be then rendered available to navigation, thus rendering London better able to cope with the increasing traffic which her ever-growing population necessitates, let alone the development of her general trade.

It has been suggested that the dock companies would disapprove of such an undertaking,

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and this idea certainly seems to gain support from the recent pamphlet published by one company, in which various objections and criticisms are levelled against the new project. It is difficult, however, to believe that if the barrage scheme were better understood there would be opposition from such a quarter. For when the Port of London is once "dockised" the dock entrance locks can be left open and the great cost of working them would be saved, a cost estimated by the principal dock company in their own case alone at £50,000 per annum. Then, again, the mud, churned up by tidal action, which now enters the docks freely during the opening of the locks, would then be almost non-existent, the dock authorities being thereby relieved of the trouble and expense of dredging out their docks.

Moreover—and this is an important consideration—if the proposed barrage conduce to the general convenience of trade and to saving of time to the shipping, it is absurd to suppose that the docks will not participate in the general benefit. It is impossible for any one to peruse the exhaustive evidence given before the Royal Commissioners without being struck by the almost universal allegation, we might say proof, of want of expedition in clearing vessels at the Port of London. The docks themselves, to a certain extent, joined in the chorus of complaint, but in their case it was directed against the barges, who had and still have the free run of the docks, and who crowd the entrances and the fairway, to the general congestion of traffic. If the entrances are left open all through the twenty-four hours, instead of being laboriously worked at intervals during the period of high tide, it is clear that the present congestion will disappear.

There is no doubt that exceptional tides, which now occasionally overflow the river banks, will in future be stopped at the dam. Also, one may fairly rest assured, that with the absence of tides and with nothing but a slow, uniform current, there must be greatly increased safety of navigation, while grounding, swinging with the tides, and collisions due to tidal drift ought to be minimised. It is well known that for most of the accidents that occur the tides are mainly responsible, so with the absence of these and a greatly widened waterway, there ought to be far safer navigation than at present.

One important feature of the new project is a railway tunnel under the dam and roadway communication above it. This will provide connection between the Midlands and the North and Dover and the South Coast, without the necessity of using the congested metropolitan lines. From a military point of view direct communication would be thereby established between the Government arsenals and the Colchester and northern depots and routes, while the barrage would form an effective defence against a hostile invasion by way of the Thames estuary.

It is proposed that the locks should be four in number, thus affording accommodation for about three times the present daily average number of vessels, 220, which pass up and down. The cost of the barrage is estimated at £4,100,000, and a toll of 1*d.* a ton would probably pay the interest and a sinking fund on the construction expenses. This, however, would trench on the analogous charge levied at present by the Thames Conservancy on vessels entering the Port of London. This, of course, shows that it is difficult to dissociate an enterprise of this magnitude from the general question of the administration of the port. If the barrage is to be put in hand, this ought to be done under the auspices of a port authority, and at present no such authority exists.

At the same time, however, much might be done and should be done in the way of inquiry. To put the matter shortly, a *prima facie* case for the Thames barrage has been made out, and the importance of the project seems to demand that no obstruction should be placed in the way of the fullest investigation. Of course there are points that seem to militate against the practicability of the undertaking. Probably the two most important questions arising therefrom are the effect on the sewage discharge and on the storm overflows into the river. As to the first, it has been asked, Will the sewage tend to accumulate below the outfalls at Crossness and Barking? This is a complex matter, depending upon the proportion of sewage that the minimum daily volume of fresh water descending the river can be relied upon to neutralise. Mr. T. W. Barber, M.Inst.C.E., who has been indefatigable in putting together all available data for enabling the public to judge of the scheme, arrives at the conclusion, after reviewing careful calculations made by acknowledged authorities like Drs. Dupré and Dibdin, that the bulk of water is more than enough to neutralise a far larger body of sewage than such as is at present discharged at Barking. The matter is, however, too technical to deal with in a brief magazine article; it is emphatically a question to be considered in the light of the best available scientific evidence.

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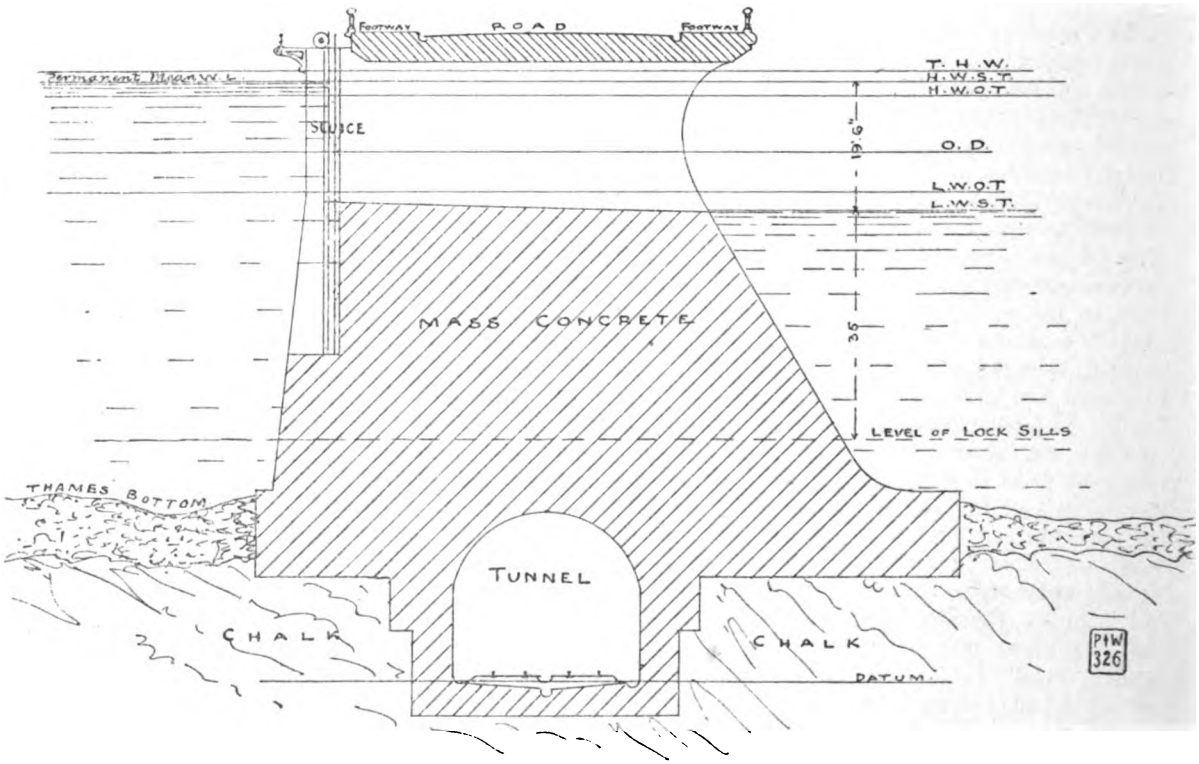
Again, as regards the future of the existing storm overflows, about fifty of which enter the river *below* high-water line at various points between Hammersmith and Woolwich, there is clearly a difficulty. The arrangement is far from satisfactory at present, because whenever a heavy downfall of rain precedes a high tide, none of the storm overflows will discharge till nearly low water. There are pumping stations at some of these overflows to enable the storm-water to be lifted into the river even at high water: if the river is to be dockised and maintained perpetually at high water, the most feasible way of dealing with the overflows would seem to be to connect all of them with sufficient pumping-stations, and pump the whole of the overflow during rain storms. But there are alternative methods of procedure, and the problem is one which will require to be examined by expert engineers from various points of view.

One very important matter has still to be considered, and that is whether the banks of the river will stand the extensive dredging contemplated by the Royal Commission of 1900–02. During the taking of the evidence there were not wanting some hints and warnings that the scooping away of so much of the bed of the river might prejudicially affect the stability of the banks and riparian property. As Sir John Wolfe Barry pointed out, protective works might have to be built. It would certainly seem far more in accordance with common sense to acquire the requisite depth of water by adding water thereto rather than by ploughing up so much of the bed. The latter would be a serious interference with the contours and conformation of the channel, while the former is merely a prolongation of the period of high water, which in the natural course of things must recur twice in every twenty-four hours.

Objections have been raised that special difficulties would arise during the construction of the barrage owing to the difficulty of making provision for the simultaneous passing of the regular traffic. This again is an engineering



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A SECTION, AND DETAILS OF CONSTRUCTION

Ordnance Datum (O.D.) is the common datum line of the Government maps. Trinity High Water (T.H.W.) is the water datum usually adopted in the river. High and low water, ordinary and spring tides (H.W.O.T.,—L.W.O.T.,—H.W.S.T.,—L.W.S.T.) are the levels of the respective states of tide in the river at various points

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rather than a general question, but it is clear that the proposed object can only be effected by constructing the dam *in sections*, if the free passage of the shipping and the tide is to be uninterrupted. Mr. Barber's idea is to build the barrage, two locks at a time, inside coffer-dams, leaving the locks open, and to construct the side sections, comprising the weirs, sluices and abutments, last of all. Whether these details are the best devisable is a professional and technical question, but the principle seems sound.

What is now required is that the proposal should be submitted to the test of practical and expert examination. The general nature of the project has been set forth in fair detail in some of the articles and lectures published hitherto. Even those opposed to the idea are fain to confess that it has some conspicuous advantages. The dock companies were at one time imagined to be friendly to the project, and it is hardly conceivable that when its merits and details are better appreciated, it will fail to command their approval. In addition to the actual saving in expense of working the entrances to the lock gates and of dredging the mud from the docks, it must be borne in mind that the London and St. Katharine's Docks in the upper part of the river will be rendered far more accessible to ships than heretofore. The larger class of vessels that are more in vogue nowadays have hitherto been unable to reach the upper docks, the usefulness of the latter being thereby much curtailed. The barrage would effectually remedy this, and distribute the various classes of craft with far more equality among the numerous wharves and docks along the river.

Of course, it is rather a strong objection that there is no exact precedent for such an undertaking. But the Charles River at Boston, U.S.A., supplies an example of conditions very similar to those prevailing in the Thames, though on a smaller scale, and in that case a most exhaustive inquiry has been carried out with a view to determining the feasibility of such a dam. A committee was appointed to conduct a thorough investigation of the existing condition of the harbour and river, and the effect that a dam would have upon the various forces operating. Every branch of the subject was carefully examined, and the resulting report was entirely favourable to the carrying of the project into effect. Particularly in regard to the disposal of the sewage the committee convinced themselves that it would be dealt with and got rid of with far more ease and effectiveness than if exposed to the deleterious action of the sea and allowed to surge backwards and forwards in the estuary. We understand that since the Boston Committee have reported the construction of the dam has been sanctioned and actually commenced.

A similar investigation seems undoubtedly called for in respect of the Thames barrage. The enormous saving it will effect over the dock-purchase and river-dredging programme of the Royal Commission is of itself a most powerful argument for instituting an inquiry, which should also make careful research into the cognate matter of dredging and its effect on the banks. A new Royal Commission or Committee under the Board of Trade would seem to be the most suitable body for the purpose, and its duration should not exceed twelve months. But it would not, of course, do to rely merely on oral evidence. The whole subject would require to be studied by experts in river currents and tidal phenomena, in sewage matters, and in all the kindred branches that harbour engineering naturally ramifies into. Placed in possession of expert opinions and all necessary scientific data, the Committee would be fully equipped for bringing general considerations to bear on the project and for arriving at a reliable conclusion regarding the most important problem that stands in the way of reforming the Port of London.

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IS HODGE HUNGRY?

THE CURIOUS TESTIMONY OF A SOCIOLOGIST AND A BLUE BOOK

A VILLAGE IN THE HANDS OF THE BOOTH-ROWNTREE SCHOOL—REMARKABLE DISCOVERIES—TWO IN EVERY FIVE OF THE RURAL POPULATION IN POVERTY!—CAN IT BE TRUE?—SCEPTICISM OF COUNTRY RESIDENTS—THE TRUTH ABOUT THE LIFE LED BY HODGE, WHAT HE EARNS AND WHAT HE HAS AT HIS MEALS

BY

"HOME COUNTIES"

NOW that long light days have come back, lambs and birds give life to the country-side, and wherever, in field, lane and coppice, green things can grow, green things are growing, the thoughts of the townsman turn once more to the rural districts.

Peradventure from this time onwards to October his habit is to sleep in a "bungalow," and make journeys to and from town every day but Sunday. Peradventure he contents himself with a week-end cottage. Peradventure he is indebted for his country air almost exclusively to his motor or his bicycle or to the hospitality of his friends who are rural residents; and only during his yearly holiday sees the country-side for weeks together.

But however short and haphazard an experience of the country Mr. Urban may have enjoyed, it is astonishing how soon he believes that he understands rural life. Why it is that the essential facts of the life and work of the people in the country seem to the townsman to be so easily within his grasp, and are really almost will-o'-the-wisp-like in their elusiveness, it is unnecessary to inquire at this point; but that they are elusive, and that the knowledge possessed by the honest and well-meaning Mr. and Mrs. Urban is, as often as not, only hazy half-knowledge, will not be questioned by any competent judge. Undoubtedly the countryman's distrust of statements about rural problems made by those who are not country born and bred has some justification.

If, after all the country life books and country life newspapers which have been published, and after all the "Back-to-the-Land-ing" of sorts that has taken place, it should be doubted whether there can actually be so much ignorance among townsfolk as to rural conditions, the city dweller need only make a simple experiment. Let him ask half a dozen of his friends two such elementary questions as, "What is the wage of an agricultural labourer?" and "What does his weekly rent usually amount to?" If the answers are unsatisfactory they will probably be not much less accurate than the statements made by two responsible writers during the past few weeks to the effect that Hodge's wages are 10*s.*, and his rent 2*s.* 6*d.* a week. (The truth is probably that no competent steady male worker on the land in England is thus ill remunerated, and that the average rent of an agricultural labourer's cottage is nearer 1*s.* 6*d.* than 2*s.* 6*d.*)

Who Really Knows Hodge?

It must be admitted that the townsman desirous of getting a grip of the economy of village life in this country has been faced by many difficulties.

To obtain trustworthy information from Hodge direct is for the average townsman a task not unlike drawing water in a leaky bucket from a deep well with a rickety windlass. The touching confidence with which foreign travellers set down as the truth, the whole truth, and nothing but the truth, the statements readily made to them by the men on the land they interrogate, must be a continual source of wonder to folk acquainted with the ways of thought of peasants of any country.

Nor is trustworthy information forthcoming in the speeches of the friends of the labourer

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in Parliament, for the House of Commons is no longer properly reported.

It may perhaps be considered that rural clergymen and ministers of all denominations ought to know the mind and life of Hodge. They are not, however, always witnesses whom every student of such a subject is inclined to make his sole guide.

The Countryman in Books

There remain such books as Mr. Rider Haggard's woeful volumes on *Rural England*. But laborious and devoted though their author showed himself—Hodge was not the only subject he studied—he was compelled to leave many counties unvisited, and he himself no doubt suspects that some of the farmers on whom this new Young descended from a motor-car were probably more picturesque than particular in their hurried talk about their men or their neighbours.

That, in an Age of Print, "printers' ink on paper" should yield no help to the townsman in pursuit of knowledge of the countryman, were unthinkable, and assuredly there are two departments of literature in which Hodge stands plainly revealed to the anxious inquirer from the city.

One department is occupied by Novels and the other by—Blue Books!

Some fiction is given by inspiration, and is profitable for instruction or for entertainment, and in both kinds of writing a clear white light has often been thrown on the life of the English labourer. A literary man living in the country might easily occupy himself to less useful purpose than in collecting for townsmen true pictures of rural life from the library of country fiction, which now ranges from *Tess of the Durbervilles* to *The American Prisoner* and *Juicy Joe*.

A Village under the Searchlight

Among Blue Books which tell us truly what manner of man William Hodge is, and how he lives with his wife and family, and rubs along with his master and his neighbours of different degrees, none is more serviceable than this new one—properly entitled Parliamentary Paper, I suppose—issued, not by the Board of Agriculture but by the Board of Trade—*Second Report by Mr. Wilson Fox on the Wages, Earnings, and Conditions of Employment of Agricultural Labourers in the United Kingdom, with Statistical Tables and Charts*. And along with it may well be read a book of the sort that is no book, except according to the usage of the country—where a "book" is any collection of print which is not a yard-square newspaper—"Life in an Agricultural Village in England," a paper compiled according to the well-known methods of Mr. Charles Booth and Mr. Seebohm Rowntree, by Mr. H. H. Mann, and published by Messrs. Macmillan in the *Sociological Papers* of the new and promising Sociological Society.

Mr. Mann and his assistants endeavoured "during the autumn of 1903"—by no means too long a space in the mortal life of investigators into so complicated a problem—to place under the microscope of the political economist the life and work of the labouring folk in a purely agricultural village in Bedfordshire called Ridgmount.

Astonishing Conclusions

There are 104 working-class families numbering 390 souls in Ridgmount (the total population is 467), and the village is largely owned and largely employed by the Duke of Bedford. What are the results of all the extensive inquiries made as to the means of livelihood and way of living of this rural community, investigations which seem to touch everything, from "money sent home by children" to the finance of hen-runs, allotments and sow-keeping? Without a tiresome reproduction of the tables with which our painstaking author's pages are packed, the facts may perhaps be fairly summarised as follows:

(1) That the average wages of a labourer, who is neither too old nor too young to receive full pay, and is not a foreman, are, inclusive of extras, 14*s*. 4*d*. a week.

(2) That the profit on an allotment of an eighth of an acre is 6*d*. a week if good land, and 3*d*. a week if bad land; on the fattening of two pigs, 5*d*. a week; and on fowls, "negligible."

(3) That a labourer, with a wife and three children, needs, in order to keep himself and household in physical efficiency, 18*s*. 4*d*. a week,* as compared with 21*s*. 8*d*. which would be needed in York.

* Minimum Necessary Expenditure Weekly for Physical Efficiency.

Family.	Food.	Rent.	Sundries.	Total.
	s. *d.*	*s.* *d.*	*s.* *d.*	*s.* *d.*
1 man and 1 woman	6 0	1 6	2 4	9 10
1 man, 1 woman and 1 child	8 3	1 6	2 11	12 8
" " " 2 children	10 6	1 6	3 6	15 6
" " " 3 "	12 9	1 6	4 1	18 4
" " " 4 "	15 0	1 6	4 8	21 2
" " " 5 "	17 3	1 6	5 3	24 0
" " " 6 "	19 6	1 6	5 10	26 10
" " " 7 "	21 9	2 0	6 5	30 2
" " " 8 "	24 0	2 0	7 0	33 0

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(4) That 75 out of 390 working-class folk were receiving parish relief.

(5) That 160 persons out of the 390, or 41 in every 100, "do not obtain the necessary amount of money to enable them to remain in physical health."

(6) That as many as 213 more belong to families who receive less than 2*s.* beyond the sum required for physical efficiency.*

(7) That out of the 160 persons who "do not obtain the necessary amount of money to enable them to remain in physical health," 3 (average earnings, 8*s.* 10½*d.*) owe their poverty to illness or old age of the wage-earner; 11 (average earnings, 6*s.*) to the death or desertion of the wage-earner; 13 (average earnings, 11*s.* 9*d.*) to irregularity of work (due in every case but one to the wage-earner's fault); 25 (average earnings, 21*s.* 4*d.*) to largeness of family (average size of family, 8.2); and 31 (average earnings, 15*s.* 6*d.*) to lowness of wages (average size of family, 5); but none—the period during which the investigation was made was August, and a different tale might have been told in the winter—to the wage-earner being out of work.

(8) That of the 160 in poverty 83 are persons under 16; 36 between 25 and 55; 29 over 55, and 12 between 16 and 25; and that of the 160 persons in poverty 33 are undoubtedly suffering owing to "the unwise and vicious expenditure of money or the deliberate avoidance of work when it can be obtained."

The Deductions to be Made

And Mr. Mann's private opinion on these striking statistics?

First.—That "the crying cause of secondary poverty ['due to an uneconomical application of earnings'] is the drink habit. Further, it has a great deal to do as a contributory cause of much primary poverty ['caused by an insufficiency of earnings, even when most economically applied, to provide for physical efficiency']. There are three public-houses, so the allowance is very excessive."

Secondly.—That "a man earning the average rate of wages must descend below the primary poverty line so soon as he has two children, unless he is able to supplement his income by an allotment, by fattening and breeding pigs, or by other means; that he will remain below the poverty line until the eldest child leaves school and begins to earn money; and that even if he has no more than two children, his only chance to save will be in his later life when the children are grown up, and are earning money or have left home. This is the most favourable case: if there are more children the period of poverty is longer and the chance of saving less. In any case during life it is a weary and continual round of poverty. During childhood, poverty conditions are almost inevitable. As a boy grows up, there are a few years intermission till, as a young man, he has two children; then poverty again till these children grow up, and, finally, at best, a penurious old age, barely lifted above the poverty line."

Last.—That "the standard of life on the land is lower than in the cities; the chances of success are less and of poverty are greater; life is less interesting; and the likelihood of the workhouse as the place of residence in old age the greater. It is evident that the outcry against the depopulation of the country and the concentration of population in the towns must remain little more than a parrot-cry until something is done to raise the standard of life, and hence the standard of wages, in our purely agricultural districts—to increase the chances of success in life, to make life more interesting, and to bring about a more attractive old age than at present, when under existing conditions the workhouse is apt to loom too large on the horizon of the agricultural labourer."

That these are very much the conclusions that are likely to be drawn by the average reader of the data accumulated in this laborious and public-spirited investigation can hardly be doubted. He will probably believe:

(1) That there must be in England many Ridgmounts in which 41 out of every 100, or say 2 in every 5 of the population are in poverty.

(2) That if in Ridgmount, where "the bulk of the place belongs to landlords who are particular as to the character of their cottage tenants," and rural life is largely under the protection of a generous and enlightened noble, the state of things is so deplorable, there are likely to be many communities in "purely agricultural districts" where the people on the land drag out their days in even more deplorable indigence.

On these assumptions it is obviously easy for

* But how about families, the reader may ask, which do not devote their income exclusively to ensuring physical efficiency but let some of it go in drink? The number of persons belonging to families with less than 6*s.* a week (the amount given by Rowntree and Sherwell as spent in England per family in drink) above the income necessary for physical efficiency, is stated as 284 out of the 390.

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the townsman, with a warm heart for the folk of rural England, to incline his mind to the advocacy of lightning cures for country ills which, did the situation seem less discreditable or less critical, he might be disposed to distrust a little or at least more closely examine.

But are the assumptions correct ?

Is there a Mistake Somewhere ?

What is the impression which the Mann inquiry is likely to make on those who, like myself, live in a " purely agricultural " village all the year round ? Frankly, that there is a mistake somewhere. One is inclined to say, in fact, that if the figures of so honest and trouble-taking an investigator give the results they seem to give, it is a case of " so much for the figures ! "

I have ventured to suggest on an earlier page that the truth about Hodge is to be found in Novels and Blue Books, and the thought which will no doubt occur to many others who contemplate Mr. Mann's gloomy picture is that in the next investigation into the life and labour of a rural district the economist may have to be accompanied by a novelist in order that imagination as well as arithmetic may be applied to the problem ! For I, for one among the village residents of England, am convinced that in my own village on the clay, where wages are particularly low, and no landowner concerns himself about our welfare, there are not 41 out of every 100 of my neighbours in poverty.

I own that I have no armoury of tables to set against Mr. Mann's. It is also the case that I am unlikely to have them in a hurry, for my rural experience leads me to doubt whether one autumn, which appeared to suffice at Ridgmount, would be long enough to carry out a useful investigation, even though our population falls considerably short of that of the Bedfordshire village. Certainly no strangers to our locality could reasonably hope to get in that time unquestionable facts as to the financial status of every local household.

And undoubtedly I and thousands of other rural residents do not believe, as Mr. Mann believes, that it is true, without any qualification whatever, that " the standard of life on the land is lower than in the cities, the chances of success are less and of poverty are greater, life is less interesting, and the likelihood of the workhouse as the place of residence in old age greater." Neither do we believe that " the concentration of population in the towns must remain little more than a parrot-cry until something is done to raise the standard of wages."

What Hodge really Earns

What is the standard of wages ?

First, however, do not let us place ourselves under the yoke of terms. On Mr. Mann's own showing the two items of lower rent and lower cost of fuel alone make 18*s.* 4*d.* in Ridgmount equal to 21*s.* 8*d.* in York.* But as every one knows who lives in a village year in and year out, there are many other things which make rural wages do more than a townsman would imagine to be possible. In regard to clothes, fruit, vegetables, milk, medical attendance, and a variety of outgoings for other than food, clothes, rent and fuel, the rural budget has advantages over the urban. This much by way of making it clear that, because a country man's income seems small, it may not really be small.

Then the townsman who asks Hodge what his wages are is as often as not in the dark as to the extras which should be added to the weekly payment. " The average wages of labourers—carters earn a shilling or two more—are 10*s.* precisely," says a writer in one of the magazines who seeks to justify the migration to the towns. (" Dulness is but a part of the evil to be contended against," he goes on ; " the plain and terrible truth is that the agricultural labourer, his wife and children, are half-starved from the beginning to the end of life ; men do not earn anything approaching a living wage.") Not a word, however, it will be seen, about extras ! But, as the Blue Book I am about to quote says, " A comparison between rates of wages is not of much practical advantage without an accompanying statement of the extra amounts earned in cash from all sources, and the value of all allowances in kind."

Mr. Mann reports the average wages, including extras, of a Ridgmount agricultural labourer at 14*s.* 4*d.* But when we turn to the figures of the Labour Department of the Board of Trade, we find the average for Bedfordshire agricultural labourers given as 16*s.* 6*d.*, and the average of no county in England returned as low as 14*s.* 4*d.*, while the average for the whole country is stated to be 17*s.* 5*d.* (If men in charge of animals are included, add another 10*d.*).

It is true that in Oxfordshire the average is

* This is surely a modest estimate of the difference between country and town in the item of rent. A fellow-villager of my own in London is paying 7*s.* for two rooms, while for one room only, with which he is about perforce to be content, the charge is 2*s.* Were he to return to the village he could have a good cottage for his florin.

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put at 14*s.* 6*d.*, and that in that clump of four counties between Oxfordshire and the sea—Gloucester, Berks, Wilts and Dorset—the receipts of the men are 15*s.* 5*d.*, 15*s.* 11*d.*, 15*s.* 8*d.* and 15*s.* 6*d.* respectively. It is also the case that in the east, Norfolk and Suffolk are marked 15*s.* 3*d.* and 15*s.* 6*d.* But there are then no English counties left where the income of Hodge is so low as the sums mentioned. In Hants and Sussex, from Somerset to Land's End, and in that belt of a dozen counties stretching from Essex on the east to Hereford on the west, the pay comes altogether to between 16*s.* and 18*s.* Kent, Lincoln, Notts, Stafford, Salop, Cheshire and Yorkshire make their labourers' remuneration from 18*s.* to 20*s.* In Surrey, Middlesex, Derby, Lancashire, Westmorland, Cumberland, Durham and Northumberland, the men earn one way and another between a sovereign and 22*s.* 2*d.*

What does he do with his Money?

After what fashion do the Government's figures show that these labourers live? According to the returns made in respect of 102 families scattered throughout the Northern, Midland, Eastern and Southern counties, the average value of the food consumed by a labourer with a wife and four children is 13*s.* 6*d.* (reckoning pork, vegetables, eggs, &c., produced at home *at shop prices, which are of course much above cost*). But Mr. Mann says that "to keep them in physical efficiency" a countryman, his wife, and four children need to spend 15*s.* a week on food. It is plainly difficult to reconcile these figures. And as the official average of 13*s.* 6*d.* (as against Mr. Mann's 15*s.*) is only obtained by the Northern counties families consuming 14*s.* 10*d.* worth (while Midland families eat only 13*s.* 6*d.*, the Eastern 12*s.* 4*d.* and the Southern 13*s.* 4*d.* worth), some three-quarters or so of the agricultural labourers of England, if the Board of Trade returns may be trusted, are apparently physically inefficient! Which, I venture to say, is absurd.

A Budget that won't Balance

How difficult it is for mere figures to picture the life of the labourer may be seen from the fact that Mr. Wilson Fox's budget for Hodge, even when he strikes a common average for ordinary labourers and men in charge of animals (who are paid at higher rates), looks badly enough. I may set out his figures as follows:

	s.	*d.*	*s.*	*d.*
Average earnings *			18	3
Deduct food for man, woman and four children †	13	6		
Rent	1	6		
Fire and light	1	9		
Clothes	3	0		
Club	0	6		
			20	3
Deficit			2	0

If one adds to the expenditure something for beer, tobacco, church or chapel, treats, and wear and tear and replacing of furniture and domestic utensils, the deficit certainly grows alarmingly. Yet most rural residents know well enough that the average household of six with 18*s.* 3*d.* a week to do with, and only 1*s.* 6*d.* a week to pay for rent, will rub along comfortably. Mr. Fox says, "The labourer's garden produce may be valued at 6*d.* to 2*s.* a week; 1*s.* a week might be realised from poultry-keeping, and 3*d.* to 4*d.* a week for keeping a pig." He also speaks of earnings of the wife and children. Even then however, the budget takes some balancing—on paper. But, happily, this is not what Mrs. Hodge is called on to do. She balances it, nevertheless. How she does it is known—to those who live in the country all the year round!

"East is East, and West is West"

No one can read through this Blue Book on the earnings of agricultural labourers without realising how little the average man is ever likely to know about the ways and life of these 700,000 fellow subjects of his.‡ We have learnt not to dogmatise about "the people of India." Perhaps this report of Mr. Wilson Fox's may do something to check wild talk about the men "on the land." It is not only that wages differ according to the part of the country one is in. The dietaries, the way of working, the housing, the technical language even of the labourer are hardly the same in two counties. If one knew all about Hodge of the Fens, one's knowledge would stand one in poor enough

* "Reviewing the available information as to income and expenditure of farm labourers, their estimated average weekly earnings, including all classes (ordinary labourers, and also men in charge of animals), are 18*s.* 3*d.*, exclusive of earnings of wives and children, and of any profits derived from the sale of home-grown produce."—Appendix viii., page 230.

† "Based on the ordinary retail shop prices, no allowance being made for the smaller cost of home-grown food."—*Ibid.*

‡ This is the number for England, Scotland and Wales only.

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stead in discussing the labourers of Devonshire or of the Border. It is like knowing one of the few hundred dialects of China: each one belongs only to a limited district.

What does even a labourer, if he belong to, say, Essex, know of foggers, garthmen, hinds, halflins, slingers, darrikers, confined men, arles, gains, cot men, followers, speaning and bolls? In one part of the country labourers live in their master's cottages; in another part in some one else's. In some counties, as in Northumberland and Durham, women are still engaged in the fields, and there are women stewards; in others "females" are never seen "on the land" from one year's end to another. In many districts there is no opening for the daughters of a labourer but in service; in other districts his value is increased in the eyes of the farmer by the possession of daughters. While in some areas the extras received by a farm-hand may be trifling, in others not only a house and a garden but twenty-five stones of pork, several sacks of grain or flour, fifty stones of potatoes, and possibly coals, beer, and milk are his portion in addition to his money payment. Shepherds in some cases get beyond their wages a trifling commission on their lambs; in certain parts of the country their whole remuneration is in kind, and they are pleased to have it so. One is acquainted with rural districts in which pigs are kept by very few men; in other districts the labourers have small holdings, or may have a cow or cows kept for them by their master.

The Customs of the Shires

I see one magazine writer criticises the present system on which labourers are engaged in many districts; but it is a curious fact that in the North, where it is the custom to engage men by the year or half year and pay them, rain or shine, a regular weekly wage, the men change their situations much more frequently than in the South, where weekly engagements are common and men lose a day's work or part of a day's work when it is wet. Nor do labourers all over the country agree to "take their money" in the same way. In some places they are paid weekly, but in other parts the wages are given only fortnightly or monthly; and in large districts the greater part of the pay is received in a lump sum at the end of the half-year or year. In the matter of piece-work, again, there is hardly any of it in the North, but elsewhere men may earn £5 above their wages or even an amount equal to a third of their pay by this system. In my own district the labourers do more than pay their rent out of their harvest money alone.

The Cottage Problem

One has read attacks on the system of "close villages," in which all the cottages belong to the local landowner; but as Mr. Wilson Fox points out, cottages in "open villages" are "frequently very inferior in construction and condition, and are often rented higher." Needless to say that "the rent received for cottages by landowners has generally no relation to the initial cost of building them." Even the "£150 cottage" is hardly a profitable investment at an eighteenpenny rent. In this connection it is of importance to notice that "the decline in the number of farm labourers between 1851 and 1901 has resulted in the decrease of overcrowding in the cottages." Another influence is also at work to reduce overcrowding, as was lately pointed out by a clerical correspondent of Canon Scott Holland's *Commonwealth*—the artificial limitation of the number of children, a practice which is undoubtedly spreading in the villages.

An Instructive Budget

It may be of interest to reproduce the following estimate from the Blue Book of "the annual earnings of a family with two grown-up sons and two daughters in a district where the money wages are18s. a week" (as in the North Riding of Yorkshire, Cheshire, Monmouth, Lincoln, Staffordshire and Shropshire).

	£	s.	d.
The Father:			
Weekly wages, 18s. a week	46	16	0
House	4	5	0
1200 yards of potatoes	4	0	0
Coals led free	1	4	0
	56	5	0
Two Sons:			
Weekly wages, 18s. a week	93	12	0
1200 yards of potatoes each	8	0	0
	101	12	0
Two Daughters:			
1s. 6d. a day in winter (say 24½ weeks)	22	1	0
1s. 8d. a day in summer (say 21½ weeks)	21	10	0
3s. a day during harvest (say 20 days)	6	0	0
	49	11	0
Total earnings of family	207	8	0

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In the case of a married hind with one son and one daughter only, the total family earnings on the same scale would amount to £131 16*s.* 6*d.*

A striking difference between the agricultural system of one part of the country and another is that "in Cumberland, Westmorland, and North Lancashire the great majority of the farm servants are unmarried men who lodge and board in the farm houses, and the ordinary labourers, as known in other parts of England, are in a considerable minority."

Hodge's Menus

The Blue Book contains several pages of "examples of the class of food eaten in various localities by farm labourers." It will be of interest to reproduce a few:

Devonshire

Week Days

Breakfast.—Home cured bacon and fried potatoes. Tea. (Eggs if about eighteen a shilling.)

Dinner.—Meat (fresh or salt), hot or cold vegetables, suet pudding.

Supper.—A pasty, or fried fish, potatoes, tea.

Sundays

Breakfast.—Bread, butter, cake, tea.

Dinner.—Roast fresh meat, potatoes, vegetables. Apple tart when in season.

Tea.—Bread, butter, cake, tea.

Supper.—Cold meat, pickles, tea.

Norfolk

Breakfast.—Bread, butter, dripping, sometimes pork (salted). Children have bread, jam, treacle, and in some cases Quaker oats.

Dinner.—Norfolk dumplings or pork, or sometimes meat left over from Sundays, sometimes stewed bones to make gravy, potatoes, bread, cheese, sometimes currant dumplings. (*Sundays*, beef or pork, fruit pies or jam tarts.)

Tea and Supper.—Bread, butter, dripping, jam, tea, sometimes cake. (*Sundays*, some men have tinned beef or tinned salmon.)

Northumberland (North)

Breakfast.—Bread, butter, cheese, bacon, tea.

Dinner.—Broth, bacon or cold beef, potatoes, suet or currant dumpling, rice or bread pudding, cabbage or turnips. (On *Sundays*, roast beef, dumpling or rhubarb tart.)

Tea.—Bread, butter, cheese or jam, tea.

Supper.—Coffee, bread and cheese.

Huntingdonshire

Breakfast.—Bread and milk, bread and lard, sop with sugar, oatmeal, tea, sometimes herrings when in season. Salt pork for the men

Dinner.—Onion and potato pudding, with a little piece of salt pork in it, suet dumplings, potatoes, and vegetables. Rice pudding for children. (*Sundays*, a small piece of beef or mutton.)

Tea.—Bread and lard, sometimes butter or jam, tea.

Supper.—If supper taken, bread and cheese, occasionally herrings.

Yorkshire, N.R.

Week Days

Breakfast.—Bread, bacon, tea.

Dinner.—Bread, potatoes, cold beef or mutton, fruit pie or pudding, and tea.

Tea or Supper.—Bread, butter, bacon or cheese, tea, sometimes potatoes.

Sundays

Breakfast.—Bread, butter, bacon, tea.

Dinner.—Hot roast beef or mutton, bread, potatoes, green vegetables, fruit pie or pudding, tea.

Tea.—Hot toast, cakes, tea, butter or jam.

Supper.—Cold meat and potatoes.

The single men who are housed in the farmhouses of the Northern counties are well fed, "frequently having five meals a day." It is in the Northern and Eastern counties that the practice of making bread at home survives. (My own village is visited by four bakers' carts!) The average weekly consumption of milk by families consisting of a man and wife and four children in 114 districts from which there are returns was 4½ pints (that is reckoning in terms of new milk, although skimmed milk is also largely bought by labourers). In the Eastern district the consumption falls to 3½ pints; in the North it rises to 6½ pints. While bread and flour to a greater value than the amount spent on meat are bought in the Southern counties, 5*s.* 2½*d.* worth of meat to 2*s.* 10¾*d.* worth of bread and flour is purchased in the North.

How they Live in Scotland

The contrast between the food expenditure of England and Scotland is even more interesting. While the average purchase of milk in Scotland per week for a family of six is 11¼ pints of new, 9 pints of skimmed and 1¾ pints of buttermilk, the English average is only 4½ pints of new or 8¾ of skim. The following is a dietary written by a Border shepherd followed by another from Stirling:

Roxburgh

Breakfast: 1st (5.30 A.M.).—Oatmeal porridge or milk or oatmeal brose; 2nd—tea, flour scones

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or barley or loaf bread with a little cheese, butter, or jam. (On *Sundays*, fried ham, boiled eggs or fresh or kippered herrings.)

Dinner.—Kail or vegetable (lentil or pea or potato) soup, followed by potatoes and pork, sometimes beef or mutton. (*Sundays*, soup usually made with beef or bones, and semolina, cornflour or rhubarb pudding, tarts or dumpling.)

Tea.—Bread and butter or jam, tea.

Supper.—Cup of new or skimmed milk (in winter, coffee), bread (often barley bread) and butter or jelly.

STIRLING

Breakfast (6.45 A.M.).—Oatmeal porridge and skimmed milk followed by tea, home-made scones or loaf bread, and cheese or jelly. (On *Sundays* at 7.30, with ham and eggs.)

Dinner (12 noon).—Scotch broth or potato soup, followed by beef and potatoes with skimmed milk and bread.

Tea (3.30 P.M.).—On some farms tea and bread is sent out to the fields, but this is not general except in haytime or harvest.

Supper (6.30 P.M.).—Oatmeal porridge with tea and bread, the same as breakfast. (On *Sundays* sometimes no porridge.)

It seems surprising at first sight that Scots farm servants are seldom members of the clubs and benefit societies to which large numbers of English labourers belong. The explanation lies, of course, in " the system of yearly or half-yearly engagements with regular wages, payable during sickness or absence from work from any other cause."

THE HIDDEN ADVANTAGES THE COTTAGER ENJOYS

To sum up, the rural resident knows that Mrs. Hodge's worries are not greater than that of many a town family on £300 or £400 or £600 a year, that she has more leisure than her town sister, that her house keeps itself cleaner than a house in town, that she is saved many town bothers, and that her household eats as sound food, if not sounder, than is consumed by those members of it who have gone to live in and earn the vaunted wages of London, and that her boys and girls look and are healthier.

" We may draw up two columns [says the clerical writer of an article on ' The Church and the Villages ; the Question of Depopulation ' in Canon Scott Holland's *Commonwealth*], the advantages and disadvantages of life as they affect the labouring man in the village and the town.

" Village

" Low wages.
Cheap Living.
Few houses and many inadequate.
Fresh air.
Little amusement.
Healthy work.
Work generally to be found.

" Town

" High wages.
Dear living.
Housing generally worse and often vile.
Foul air.
More amusement.
Employment often unhealthy ; none to be compared to work in the fresh air.
Work often impossible to be found.

" The second item needs explanation. When we call living in the country cheap, we do not mean that the shops are particularly moderate. But the garden more than compensates for this. He grows at a cheap rate what forms a large part of his diet. He has not to buy everything as he would have to do in the town ; and in addition to the garden there is the inevitable pig, a sure source of food or money. It must be also said that in the country there is little distress. The writer has never seen in any village the abject poverty which meets one in every street of a large town."

No doubt the food put on the table and in the men's bags is plainer than town fare, but it is eaten in healthier conditions than are usually experienced by the labourer turned townsman ; and surely it does not need a physiologist to see that simple food, slowly eaten, and as often as not in the open air, is calculated to do the consumers of it as much good as a more complicated diet bolted by wearied bodies in the bad atmosphere of London " cawfee " houses and carters' " pull-ups."

The notion that the labourer's family which goes to London to live proceeds to devote a large proportion of its increased income to the promotion of physical efficiency is not likely to be entertained by those possessing a knowledge of the life of the labouring classes in London. It is not the grocer and butcher who benefit by the increased income, but the landlords, the coal, firewood and lamp oil men, the tailors, drapers, upholsterers, vendors of cheap jewellery, the music halls, theatres, the bus, tram, and train companies, those who arrange cheap excursions, bean-feasts, and social clubs, and last, but not least, the chemists.

IN PRAISE OF BREAD, PORK, AND RAW ONIONS

No doubt labourers' families in a cottage, like labourers' families in 3 House, 2 Court, Something Street, Old Kent Road, spend money on that which is not bread, and are badly in

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need of being taught that beer is not food, that all foods are not of equal value, and that it is folly to spend so freely on hats, dresses and ornamental perambulators; but because they require such instruction is not to say that they are underpaid. A great agricultural authority once described a distinguished writer, who some years ago brought out a book on a rural problem, as "seeing all things sharply and precisely, untempered by experience of the give and take, the compromise of things as they are"; and on no questions is it easier for the townsman to think and write like a doctrinaire than on agricultural questions.

The fact that the white-faced labourers who were once "on the land," and are now pretending to enjoy in a noisome London "cawfee" house a heavy meal of meat and "greens," margarine-made tart and beer, would turn up their noses at two-inch-and-a-half thick slices from a home-made loaf, a hunk of cheese or fat pork, and two raw onions, eaten slowly and with relish below a tree, does not prove that their fellows dining at that moment on such fare are starved. I for one who have experimented with the bread, cheese and raw onions know better. But even with an analyst's and a physiologist's report before him, many a townsman would hesitate to believe that such a dinner could be as wholesome and as attractive as it really is. As a matter of fact, I do not remember to have met a single intelligent townsman in the country who has not distressed himself unnecessarily on the labourer's behalf when he has become acquainted for the first time with the staple mid-day dietary of the men "on the land."

Life in our Village

There is another direction in which the intelligent townsman does not grasp all the facts of cottage economy. That in some districts women work on the land he knows; but he does not understand the many ways in which cottage women and children may earn money, which, if small in amount, all adds to the net income of the household. As I write I look from my window up the village street, and I know that at three cottages money is earned by killing and plucking poultry, not only for local consumption at the hall, the manor house, the farm-houses and other houses which are not cottages, but in larger numbers for the London market. At a number of other cottages there are women who do washing, ironing and mangling, who go out cleaning, or who do sewing. Elsewhere lives the "howdy" or several "howdies." Then "arrants" have to be run: many children have modest weekly contracts for errands. Three girls help the postmistress by acting as sub-letter-carriers.

Nearly all the old men and women—including not a few who still work—have been in receipt of club pensions since they were sixty. Those who have no such resource and are widowed, and have no son and daughter, occupy one of the almshouses, and a number of people are "good to them" throughout the year. In the cottage nearest me, where there are three sons, all work; and one of them, like his father, is getting cattleman's wages. In the next cottage both the old people have pensions and still earn a little, and the son who lives with them is on full wages. In cottage number three there are six children, but the father's wages, more than those of the ordinary labourer, are supplemented by the earnings of three of the young people.

The Bicycles of the "Starving"

The weekly wage, not counting extras, is with us from 12*s.* to 13*s.* for men who have no charge of cattle, horses or sheep; and, the townsman may think, could not well be lower; but if the villagers are starving, as one writer who has been quoted alleges, or if they are physically inefficient by reason of lowness of wages, as would appear to be suggested by the results of Mr. Mann's inquiry, how is it that when I offered a horseman's girl 1*s.* 6*d.* a week to fetch my papers from the station each morning on her way to and from school—it would have entailed an additional walk of three-quarters of a mile at the outside—her parents refused it as not enough? How is it that much of the making of under and outer garments is put out? How is it that when the chapel wanted cleaning no woman could be got to undertake the job for two months? How is it that two newcomers who wanted their just-built cottages rough-cleaned had to go to the next parish for women to do it? How is it that the following advertisement has appeared for seven weeks this spring in several papers circulating widely in rural districts, without a single desirable applicant coming forward:

> COOK-GENERAL, about 40, wanted, at once, for small house in country; must have good references and do plain cooking well; two in family; young girl kept; man for boots and knives; good home: good wages to thoroughly competent woman.

How is it that youths and maidens are always well-shod and are always getting new hats?

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How is it that no man on the three farms next my house now takes advantage of his master's permission to have field room for two rows of potatoes, though all the man claiming such ground has to do is to provide the seed and collect the crop, for the "taters" are ploughed in and out by the farm team. How is it that every youth in the village, and almost every girl, who wants a bicycle has got one? It is indeed rather significant that in the magazine article I have quoted, in Mr. Mann's paper and in the Government Blue Book, there is no mention whatever of bicycles, the existence of which in large numbers in most purely agricultural villages with which I am acquainted is now an undoubted fact. As the expenditure on the purchase and the maintenance of a bicycle is considerable, the existence of bicycles —and in every one of the six cottages occupied by labourers' families, which are within view from my window, they exist—can hardly be reckoned a sign of poverty.

Frugality versus Poverty

Returning to the food question, I cannot help suspecting that one of the reasons why the townsman, be he of the working or the professional class, draws false conclusions from what he sees of the way in which cottagers live is that he lacks the experience of living on narrow means which would enable him to form sound opinions. Neither he nor his womenkind have any notion of how to manage a home on £1 a week, much less on 16*s*. They do not think it possible; therefore, they argue, it is impossible. They are horrified, for example, at the idea of housekeeping into which only one fresh piece of butcher's meat may enter in a week, forgetting that more than half the population of the globe works hard without any butcher's meat at all. They attach some meaning or other to the word economy, but with the old-fashioned word frugality they have little acquaintance. Now Mrs. Hodge's housekeeping is only practicable because it is frugal. But that is not to say that it is poverty-stricken. One can live frugally and yet live well, or, in the new phrase, physically efficient.

Apart from the boiled tea, superabundant beer—though some of it (I am myself a convinced teetotal er) may possibly have value, when home-brewed, as a palatable accompaniment of a meal—and too much smoking and chewing of tobacco—all faults, let it be noted, of the townsman also—the thing that strikes me about Hodge's dietary is what must impress any patient observer in regard to his way of working, its wonderful adaptation to the circumstances of the case. Bread, cheese, salt pork, beans, onions, greens—the fare could hardly be chosen with a more intelligent regard for frugality and effectiveness. An old labourer I know, whose wages are never more than 13*s*. and extras, is accustomed, before starting out to work in the morning, to drink a large basin of gruel, made overnight, and warmed while he is dressing. It sounds like poor living, but what could be better for an elderly man, or cheaper? The gruel stays him till his eight o'clock breakfast time, when he has some bread and cheese and perhaps an onion. At noon bread and pork and onion. In the evening a hot dinner, into which either more pork or the remains of Sunday's butcher's meat, with greens and potatoes and "pudden," or tea and bread and butter enter. On Sundays there is of course a more elaborate "spread." To say that old or young are like to be "half-starved" with such fare is to talk nonsense.

Help that may Hinder

That there are directions in which the labourer can be helped goes without saying—there is room for preaching (and practising ourselves) temperance, simple living and dressing, sanitary housing and wholesome recreation—but it is very easy for unwise well-wishers to do Hodge more harm than good. I hope that some day his wages may be raised; but I say most seriously, and as a Radical, that until he has been taught to spend his rise in wages to good purpose, and until the deplorable effects of the last decade of school teaching on the wrong lines—happily in the way of being altered—are neutralised, it might be by no means a boon to Hodge merely to increase his income. During the last half century, as the Blue Book to which reference has been made makes clear, the wages of farm labourers have been nearly doubled. That in the old days Hodge had a hard time of it in many respects no one has questioned; but it is impossible to believe, now that his wages are almost as much again as they were, and the prices of bread, groceries and clothes have fallen so remarkably, that he is still "half-starved," and that his most urgent requirement is higher wages.

I may perhaps add that this article has been read in proof and fully approved by two competent authorities in Warwickshire and Essex, where the wages are particularly low.

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AGRICULTURAL EDUCATION IN CANADA

THE TRAINING OF YOUNG MEN TO FIT THEM FOR LIFE ON THE FARM—A GENEROUS GOVERNMENT—THE EXCELLENCE OF THE ONTARIO AGRICULTURAL COLLEGE—A LESSON FOR THE HOME COUNTRY

BY

TOM BROWN

"AS in the past, so in the future, agriculture has been and ever will be the most important industry in Canada. Without it the country would practically cease to exist, certainly it would never be able to maintain its position amongst the leading countries of the world. You in England do not realise the enormous size of Canada, and would never think of comparing it in this respect to the United States. Yet as a matter of fact it is larger, but it must be borne in mind that vast tracts of land are ice-bound for several months of the year. Manitoba alone, if properly cultivated and tilled, could produce a quarter of the entire wheat crop of the world. All we want now in order to make us into a mighty nation is men and women. Huge tracts of land are now lying useless, which, were there sufficient men and women to work them, could be made to yield an excellent profit. Canada could with ease, provided people were plentiful enough, produce annually more than the present wheat crop of the whole world. Perhaps one of the most striking features of our country is the vast area of land unpopulated and uncultivated, which if only men could be enticed thereto would yield a thousand-fold. The fertility of our virgin soil is truly marvellous, and perhaps you will be surprised to learn that no manuring is necessary, in fact one of the most urgent difficulties against which our farmers have to contend is to get rid of their manure. It is the custom in many parts merely to harvest the grain, burning the straw afterwards as it stands. Many farmers in the east are in the habit of taking up one or two holdings in the west, consisting of 160 or 320 acres, merely in order to grow wheat thereupon. Such farmers live in the east, but as each spring comes round go west for a month or so, whilst the seed is being sown, returning thither in the autumn for a similar period to harvest the grain."

So spoke Mr. C. C. James, Deputy Minister of Agriculture for the Province of Ontario, in a very interesting conversation I had with him last June, whilst travelling through the States and Canada. It gives in a few forcible words the position of the Canadian agricultural industry at the present time, and from the observations I made in going about the country, I saw how very true Mr. James' words were. I want briefly in this article to deal with one portion of the Government's work, namely, the training of the young men to fit them for a life on the farm, and to enable them to become successful farmers. I shall refer especially in this connection to the Ontario Agricultural College, situated at Guelph, as it represents the standard of excellence as far as agricultural education is concerned, and may be taken as a typical example of what such an institution should be.

The Canadian Agricultural Colleges and Experimental Stations have a distinct advantage in one respect, compared with similar institutions in this country, in that they receive much more help of a financial nature from headquarters. It is true the English Board of Agriculture assists the agricultural colleges to the extent of about £8000 per annum, by grants varying in amount with the work that is accomplished; but in Canada every province has its own college and experimental station, largely supported by the Government, and at some of these excellent work is being done. The existence of an experimental station in every province means that the special and peculiar conditions prevailing in the district are thoroughly studied, and directions as to the most suitable manures, crops, and methods of cultivation are scattered broadcast by means

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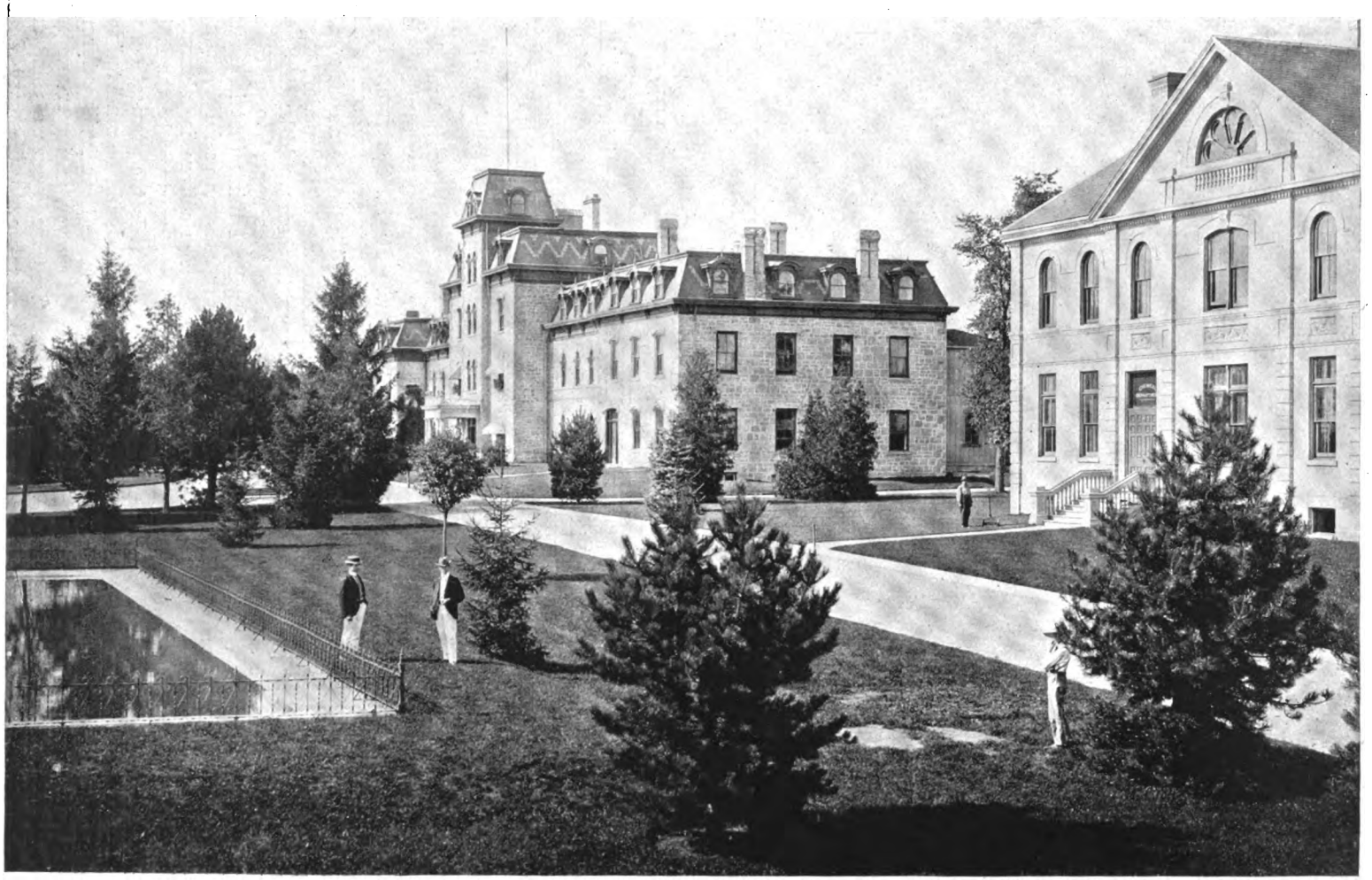

THE TRAINING OF YOUNG MEN TO FARM IN CANADA

A view of the main buildings of the splendid Agricultural College at Guelph Ontario

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THE HORTICULTURAL BUILDINGS

of bulletins, of which millions are disseminated annually. It is almost needless to say that the conditions vary to an enormous extent in so vast a country. One class of farming might be suited to one locality, and in another totally unfit. We have not the same degree of variation to contend against in Britain, for, generally speaking, the conditions are more equal. Of course, the South of England and the North of Scotland require different methods, but the differences in this respect are not as great as in Canada. The Canadian Government is certainly more generous than our Government at home.

Owing to the fact that more substantial aid is given by the Government to agricultural colleges, it was to be expected that the students' fees would be on a lower scale than is the case in Britain, and thus the Canadian colleges appeal to a greater variety of students. As far as I could judge, many of the pupils came from quite small farms, and in some cases I was told their parents were comparatively poor. This is undoubtedly as it should be, and I was delighted to meet some young fellows who were the sons of labourers, but who were nevertheless excellent students, industrious and intelligent, and who will some day in all probability be well-to-do farmers. It is not thus in Great Britain to anything like the same extent. The higher fees charged mean that only prosperous farmers are able, even when they are willing, which does not necessarily follow, to send their boys to an agricultural college, as otherwise the expense is too great in proportion to means. There is, moreover, another point to take into consideration. In Britain poor men have not the same opportunity of taking small farms as is the case in Canada, as the number of small farms and holdings here available is comparatively few. It is, therefore, almost useless for a poor man to save and scrape all he can in order to send his lads to a college, when, at the end of the course of instruction, the only positions open to them would be that of labourers. Our colleges thus appeal to a different class, but personally I think that in this respect we might learn a very useful lesson from the Canadians. Agriculture is, always has been, and probably always will be the mainstay of a country, and thus the greatest encouragement and assistance should be rendered to those who attempt to make their livelihood from the land. We have, however, an important point in our favour. In Canada such a thing as technical education, taken to the very doors of the people, is practically unknown. By this

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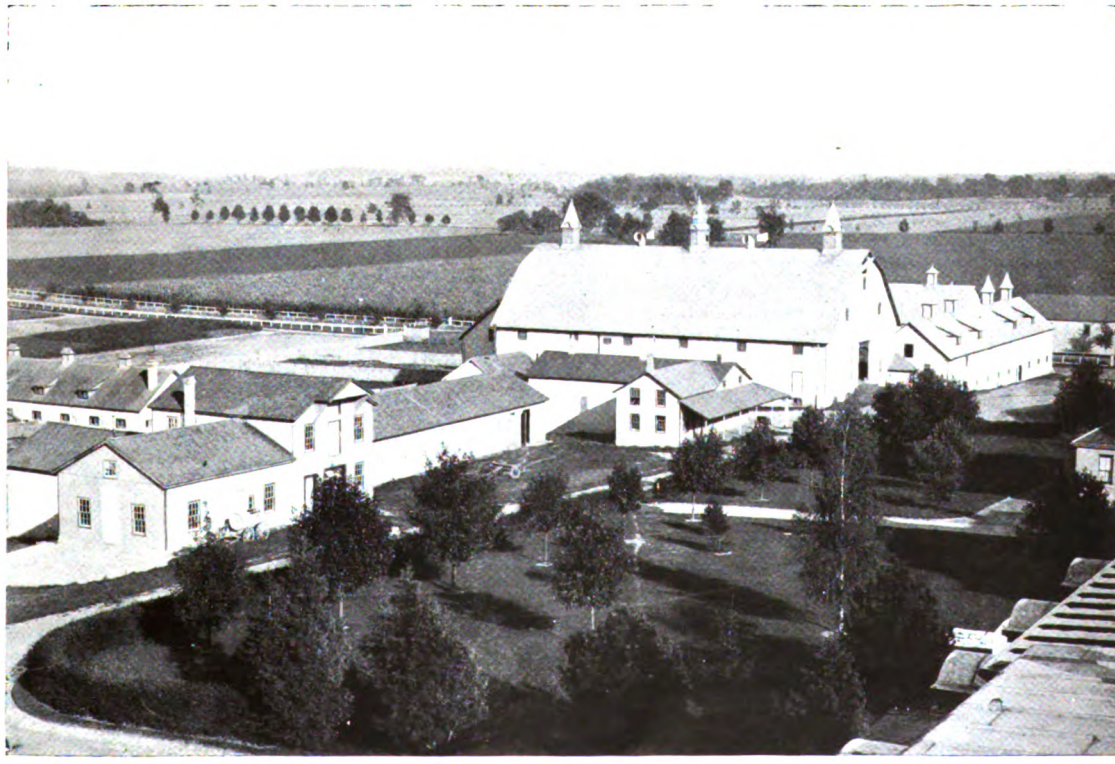
system of teaching subjects are brought within the reach of the poorer classes. We spend nearly £1,000,000 annually on technical education, and it must be admitted that this has done an enormous amount of good.

One feature at the Ontario College struck me as remarkably good. I cannot say for certain, but I do not think it is adopted at other institutions. The work on the farm is divided into seven sections, and the students are required to work in rotation in these departments, taking their turns at a variety of tasks, clean and dirty, easy and difficult, whatever is to be done, without favour or distinction. Every alternate afternoon is devoted to work on the farm, which work is paid for at from three to fivepence per hour, and the amounts thus earned are credited to the board bills. It is possible for a hard-working student to make his living expenses, or, if he cannot quite do this, he can materially contribute towards his expenses. As the *College Circular* says:

"A limited amount of time devoted to practical operations on the farm and in the various departments enumerated above (here the seven branches are given in detail) is, we think, well spent, especially by those who have not had much experience in farm-work. Farmers' sons are more benefited perhaps by the class-room work, but even these find the work outside agreeable, and in some respects helpful. It assists them in paying for their board bills, prevents them from losing their taste for farm-work, gives them practice in using carpenter's tools, and affords them a good opportunity of becoming acquainted with a large variety of the most valuable breeds of horses, cattle, sheep, pigs, and poultry, in addition to the knowledge they gain respecting the handling of milk, and the making of butter."

I found in one respect the farmers of Canada and Great Britain are very similar, in that they are exceedingly conservative, and many of them do not believe in what they call "college farming." There are plenty of farmers in this country who will not send their sons to an agricultural college, as they consider the scientific teaching of little use for practical purposes. This class is, however, happily dying out, and a younger and less conservative generation is springing up, and there are signs of a similar change in Canada. All new movements—and agricultural colleges are compara-



THE FARM ATTACHED TO THE COLLEGE

The students perform the work of the farm as part of their education and are paid for their labour

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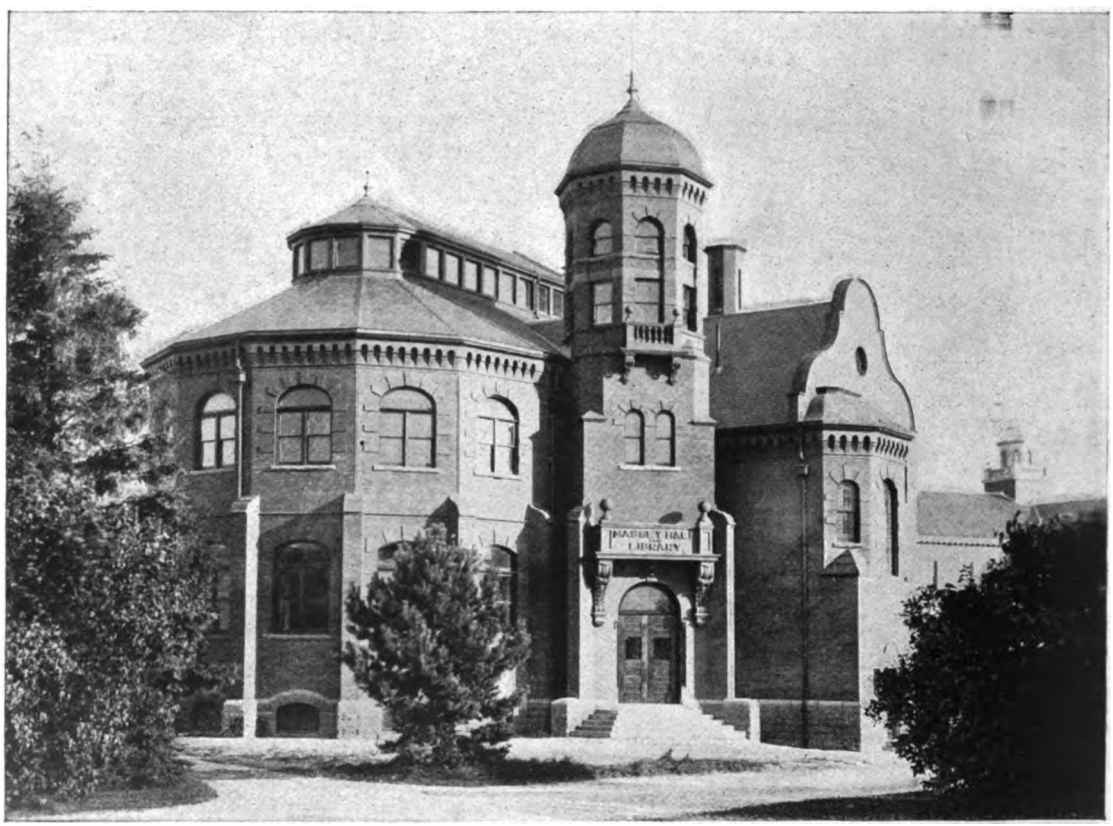
tively new—are condemned by some people, but this is only to be expected. Frequently the greater the amount of good the place is doing, the greater is the condemnation, especially during the first few years.

With regard to the actual course of studies, there is not a very great difference between the two countries, and the curriculum varies only in minor details. As to equipment, in some respects we are behind, in others ahead. In some cases the buildings are finer in Canada, and this especially refers to the college at Guelph, and the number of students attending the courses is greater than we are accustomed to. In the farms, the farm buildings, and the farm-stock I think we are superior, although it must be borne in mind that in this country not all the agricultural colleges have their own farms attached. Guelph is the finest agricultural college I have ever visited, and is considered by many to occupy the first place in either Canada or the United States. The buildings are exceptionally fine. Through the courtesy of the director, Dr. Mills, I was enabled to obtain some photographs of the college and the farm, a few of which are presented here. It will be seen at a glance what magnificent erections they are, and they are equally fine inside. Special mention should be made of the library, containing upwards of twelve thousand volumes, presented to the college by Mr. Massey. Within this building there is a large lecture hall, used on speech days and similar occasions, a finely furnished reading-room, and the library.

Attached to the college is a farm of 550 acres, where all the many and varied branches of farming are taught. The excellent system of allowing the students to take part in the regular operation of the farm, and paying them for their labour, has already been noted. Only in this way is it possible for the students to become thoroughly acquainted with the routine of farm-work. All kinds of stock are kept; there is a well-equipped and quite modern dairy; whilst the poultry department has in no wise been neglected. Everything on the farm is of the latest.



THE MASSEY HALL AND LIBRARY AT THE COLLEGE

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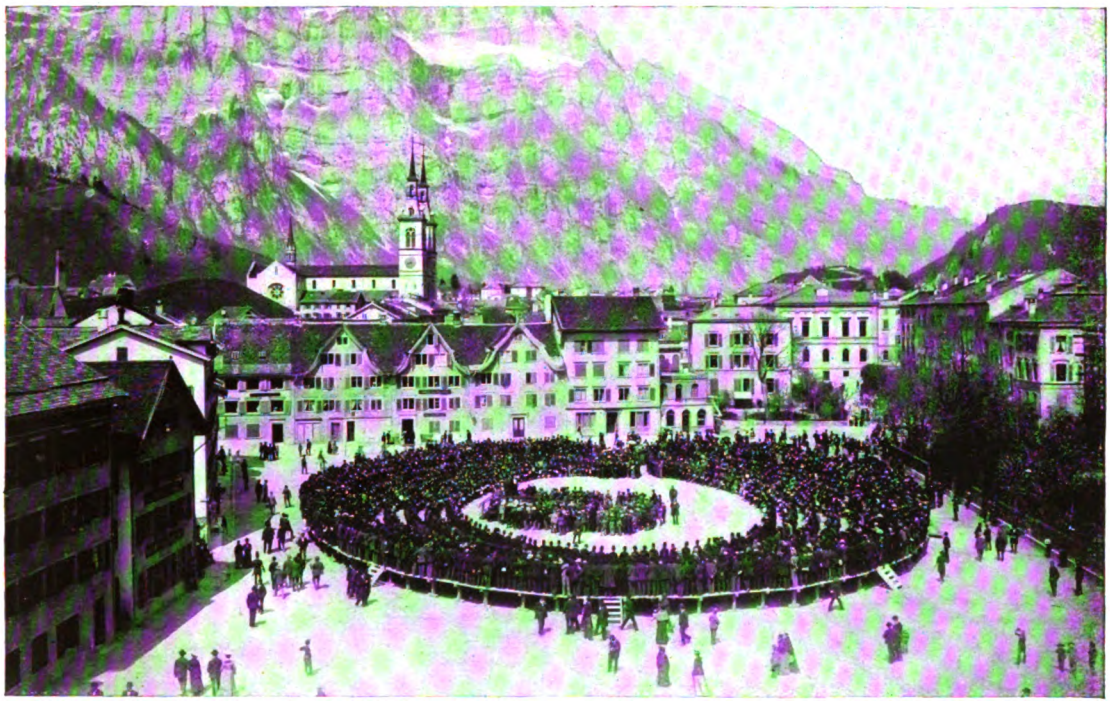

THE SWISS PEASANTS' PARLIAMENT

THE OLDEST EXAMPLE OF PURELY DEMOCRATIC GOVERNMENT IN THE WORLD —PICTURESQUE GATHERINGS IN SWITZERLAND THIS MONTH

BY

HERBERT P. DEVITTE

AT a season of the year when comparatively few tourists are to be seen in the playground of Europe, the Landsgemeinden or popular assemblies are held in the primitive Swiss cantons—on the last Sunday in April or the first in May, according to the custom of the particular locality. The first meeting of the Landsgemeinde, which is the oldest example of purely democratic government to be found in the world, took place in the year 1294, but the germs from which these assemblies have been developed can be faintly traced to the beginning of recorded history.

The Gemeinde or commune and the Landsgemeinde are the two most characteristic institutions of the Helvetian Republic and the fountain heads of individual right and political life. The Swiss citizen is, first of all, a member of his commune, which is the unit of political life, and upon it the Federal Constitution has been based. Each commune is in itself free and independent, being practically a state in miniature with an organised government of its own, consisting of an executive and deliberate body. In the cantons of Glaris, Uri, Obwald, Nidwald, and the two Appenzells, however, there is but one council—the executive—and everything of a legislative nature is transacted at the annual popular assemblies. These are the Landsgemeinden. They are held at Altdorf, Glaris, Sarnen, Stans, Appenzell and Trogen, generally in the midst of magnificent scenery.

As the manner of procedure at all the Landsgemeinden is very much the same it will suffice to give an account of one in order to describe

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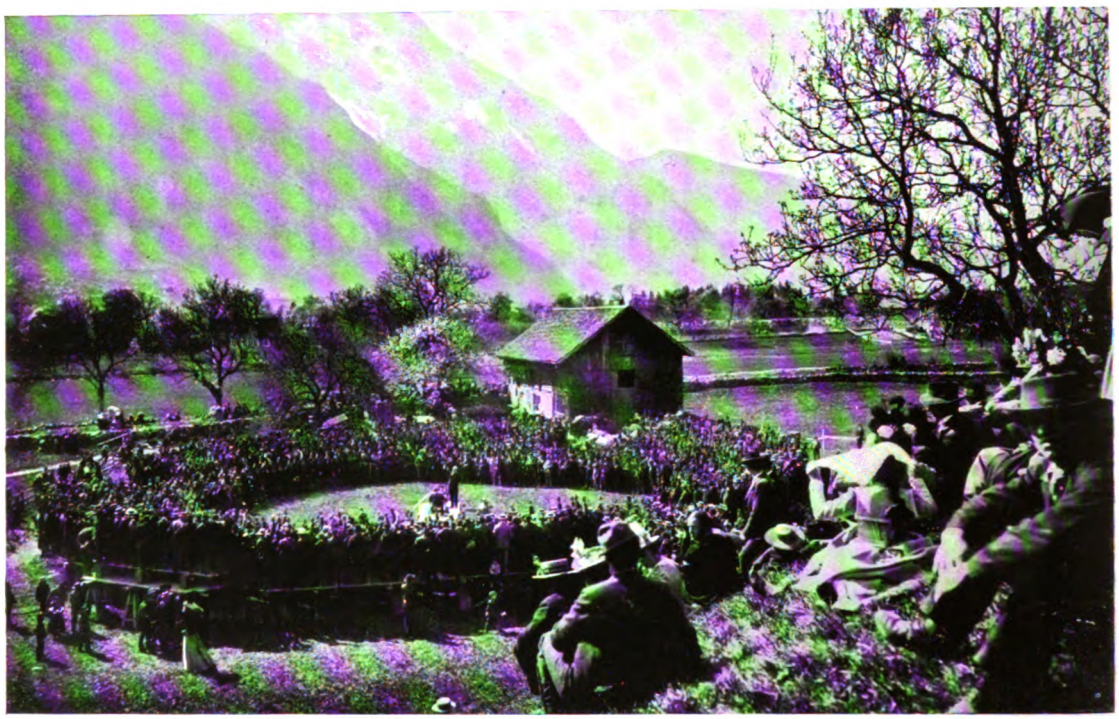
the rest. For this purpose I shall select that of Uri, which I had the privilege of attending last year. It is a typical sunny May morning. A gentle breeze is blowing the fragrance of the neighbouring pine woods and green meadows into the little town of Altdorf, the *rendezvous* of the voters, who, accompanied by their families, are arriving in groups—driving, walking, or by train—from Fluelen, Goeschenen and the villages around.

At noon the little market-place of the town



THE VOTERS ASSEMBLED ON A SUNNY MAY MORNING AT ALTDORF

is thronged with a good-humoured crowd, dressed mostly in sombre colours, but a glimpse is obtained now and then of the picturesque national costume. It is a curious and unique sight. A roll of drums is heard above the hum of voices, and the procession forms. A squad of soldiers escort the standard of the canton to the front. Two men dressed in frock coats, each bearing bulls' horns, the symbol of Uri sovereignty, follow. The Landamman or president, the cantonal authorities and the voters come next. The band strikes up a lively march, and the procession starts along the Great St. Gothard road, to the meadow—some two miles distant—where assemblies have been held from time immemorial. Half an hour later the voters are seated or standing on an elevated circular platform. The centre of the circle is occupied by the president and officials. Hush!

Heads are uncovered, women bow—the vicar is blessing the meeting. The business before the assembly on this occasion was very brief, the five propositions of minor importance being all rejected. The various matters to be settled are explained to the voters, the arguments to and for stated by the different speakers, and the questions decided by a show of hands.

The Landamman and the other public officials then resigned their posts, and the majority were re-elected for another year. The whole business occupied about a couple of hours.

The neighbouring peaks assume a rosy hue, and light shadows begin to fall upon the valley as the vicar brings the meeting to a close with a short prayer. The women and children, who have been wandering in the woods and meadows, now join the men folk. The procession re-forms and marches back to Altdorf—a year's work is accomplished. Simple and prosaic as this political act may appear, a spectator turns from it with a feeling of having witnessed a religious ceremony. Under God's sky, in sight of His mountains, these primitive peasants, one feels, are setting the world an example in practical, rational, and ideal government.

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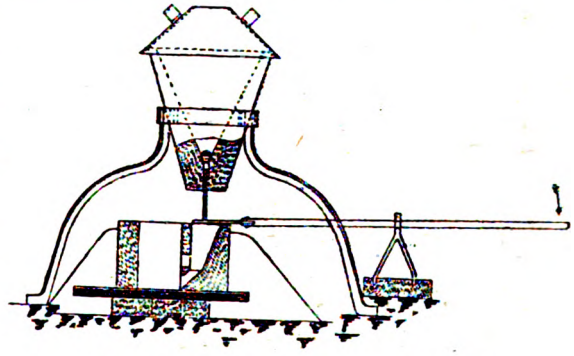
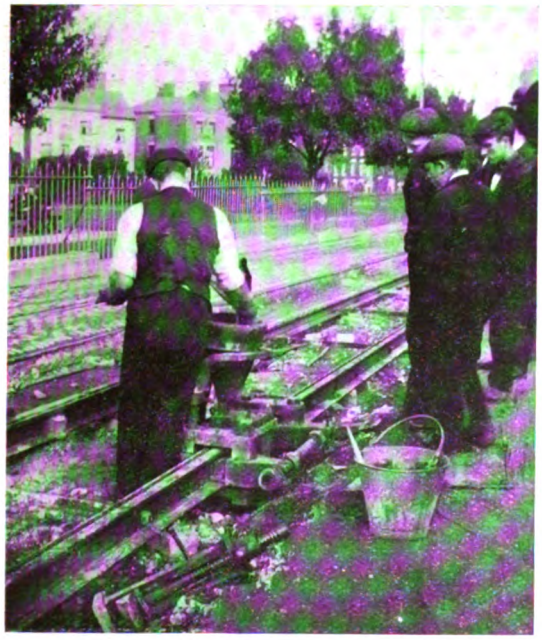
THE NEW "THERMIT" PROCESS OF WELDING

ALUMINOTHERMY—A NEW PRINCIPLE APPLIED TO METALLURGY—ITS USES FOR WELDING TRAM RAILS, REPAIRING BROKEN PROPELLER-SHAFTS, AND OTHER WORK

THE thermit process, or aluminothermy, is now used in many operations involving the casting and welding of steel or iron. It is of considerable scientific interest, as being the application of a new principle to metallurgy—namely, the expulsion from its oxide of one metal by means of another which has a greater heat of combination with oxygen. The process has been rendered possible by the cheapening of aluminium, which has a very strong affinity for oxygen. That this is so may be realised by considering what a large amount of energy in the form of electric current must be brought to bear upon the mineral alumina (aluminium oxide) before the metal is separated from its oxygen. Aluminium combined in clay, and the metal calcium, in limestone, occur in much greater quantities on the earth's surface than metals such as tin and copper; yet so firmly united are they to oxygen that the ancients had no suspicion



VERTICAL SECTION OF THE THERMIT CRUCIBLE



POURING THE POWDER INTO THE CRUCIBLE

of their existence, although tin and copper and their alloy bronze were freely used. This is not a digression but accounts for the properties of thermit. If powdered aluminium is mixed thoroughly with an oxide such as iron rust, and the temperature at some point in the mixture is raised sufficiently to start the action, the aluminium will seize the oxygen of the rust, leaving metallic iron, and give out such intense heat in so doing as to make the pure iron absolutely fluid, which means a temperature of about 5400° Fahrenheit.

The thermit crucible shown in vertical section has at its bottom a burnt magnesia stone perforated by a hole which is closed by a thimble of the same material. Above this is an iron disc covered with sand, and above this again is poured the thermit powder, two pounds of which yield one pound of iron. A pinch of ignition powder placed above is lit by a fusee match and starts the action. The cover is

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WELDING TRAM RAILS AT COVENTRY
The molten iron running into the mould

placed on, and almost instantly a dazzling white flame shoots out at the top and continues for some seconds. In half a minute the molten iron is ready, then the lever shown is pushed down, raising the pin and thimble, so that the iron runs through the hole into the mould below. The process is largely used for welding rails in position as shown in our photographs.

Thermit can also be applied to large welds and is particularly useful for repairs which must be executed quickly, and in places where no large foundry is available—such as broken crank- and propeller-shafts and connecting rods of steamers. It is said that the rapidity of repairs to the Russian fleet at Port Arthur was due to the use of thermit. Another application of thermit is in the prevention of what is known as "piping" in large steel castings. The workman waits until a crust has formed on the surface of the molten steel, then breaks through this and thrusts the box of thermit to the required depth. The reaction as usual proceeds almost instantly, and then the open hole is filled up by pouring in more steel kept ready for the purpose.

INSIDE A GRAIN ELEVATOR

A MARVEL OF MODERN ENGINEERING—THE LATEST ELEVATOR AT LEITH DOCKS—AN EXAMPLE OF WHAT ELECTRICITY CAN DO

IT is one of the marvels of modern engineering, a grain elevator. By its aid many men are dispensed with, and the cargo of a large Atlantic grain-carrier is discharged at the rate of 350 tons an hour. Manchester has a tall elevator, but the new one in Leith Docks just erected by an English firm is the first in Scotland.

A steel tower rises nearly 80 ft. above the quay. It is not ornamental, but in a very compact space much busy work is done; and only two men are to be seen. A heavy steel girder, 84 ft. long, is so nicely balanced that a 5-h.p. motor can move it about with as much ease as if it were a feather. Suspended from this girder is a steel double leg, 74 ft. long. An endless band containing 160 buckets of steel moves up and down this leg at a speed of 500 ft. per minute.

High up in a conning hut in the tower the elevator man stands peering through a glass window at the ship beneath him. He looks right into the vessel's hold, and his hand is on a small electric switch. A touch and the sixty tons weight of girder and outside leg moves downward; another touch and the lower end is deep in the hold among the grain loaded at the American or Australian or Black Sea wharves.

Another switch is moved, and a second motor, one of 50 h.p., sets the steel buckets rapidly revolving. The grain is scooped up, and when at the upper extremity of the leg, the buckets, tilting over, empty the corn down a telescopic shoot into a hopper at the foot of the tower. It is all so simple, and so smoothly effective. There is no rattle of steam winches and filling of sacks and crowding of grain porters. In the ship's hold four huge steel shovels driven by a 25-h.p. electric motor are soon at work drawing the cargo from the far corners to the devouring buckets.

Meantime, the grain deposited at the foot of the tower is being ladled up in steel buckets

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on a revolving band, and lifted to the top of the structure. It has to be weighed before it is despatched on its journey to the immense warehouse. The weighing is expeditious. At the top of the tower it falls into a large hopper, and then drops into the weighing hopper immediately underneath. An attendant stands, with one foot on a pedal, one hand on a lever, his eyes on the weighing-machine. Quickly the recorder approaches the full weight of five tons. Pressing the foot pedal he slows down the incoming grain until a mere trickle of seeds brings the scale to the last ounce; then the flow is shut off. Pulling the hand lever a trap door is lifted and the weighed grain tumbles down into a third hopper.

The next step is a very pretty one. It is the conveying of the grain to the silo warehouse 600 ft. distant. This is accomplished by means of a rubber belt, an endless belt 3 ft. broad, and always travelling swiftly. The corn is automatically fed on to this belt in a constant stream. Along under the shed roof and through a narrow gallery high above the quay the load is carried until the warehouse is reached. It is an attractive spectacle, the river of golden grain from across the sea, and the 1200 ft. long belt of 1 ton 15 cwt. of rubber, driven by a 60-h.p. motor, does its task well.

Inside the warehouse one million bushels can be stored. It is a building within a building. The outer shell is of brick; the inside is divided up into bins made of timber, which sink 12 or 18 in. when full. The total weight of grain will be 26,786 tons. Everything is done in the way of handling the corn by electric motors. Belts convey it above the floor; elevators hoist it to the top storey, where it is automatically emptied into any bin desired. There are four weighing-machines. When the grain has to be sent away, railway waggons or lorries are run along the basement floor. Forty waggons per hour are loaded in bulk; or 4000 sacks are filled and despatched each hour.

Without electricity the thing could not be done. At any rate, with steam or hydraulics much more room would be required, and there would be a confusion of driving belts. But five electric motors in the ship tower, five smaller ones in the tower for unloading barges, and no fewer than sixteen motors in the warehouse, accomplish the whole work, and yet are so compact and occupy so little space that the visitor wonders how the power is obtained.

THE LEITH GRAIN ELEVATOR

Showing the rubber conveyer-belt for grain in "gantry" leading from the elevator to the warehouse

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WHAT TO DO WITH OUR BEGGARS

WAYS THAT ARE DARK AND TRICKS THAT SUCCEED—PROFESSIONAL BEGGARS WHO EARN £3 A WEEK—THE EVIL OF INDISCRIMINATE ALMSGIVING—A SCHEME FOR SETTLEMENTS WITH FACTORIES

BY

JOSEPH BOSLEY
[EX-MENDICITY OFFICER]

Illustrated from photographs specially taken for THE WORLD'S WORK AND PLAY

FOR many generations the authorities of this realm have been endeavouring to find some suitable plan for effectually dealing with the beggars who infest the country highways and the streets of all populous cities. More than one Act of Parliament has been passed to minimise the nuisance; but none of them has had the desired effect. The difficulty is just as great now—and apparently just as insurmountable—as it was years ago. The efforts made by the police to stamp out the professional beggar have simply made him more artful and more cunning; and in fertility of resource and tenacity of purpose he has proved himself superior to those who try to wipe him out. There are few more crafty men than the London variety of the professional beggar.

We have all heard of the "Soapy Fits King," the man who shammed fits in the street, and foamed at the mouth to arouse the sympathy of passers-by. The "foam" was produced by a piece of soap concealed in his mouth, but sympathetic men and women almost tumbled over one another in their anxiety to obtain brandy for him at the nearest public-house, which he took care should be close at hand. Soap and brandy must have been a very peculiar mixture, but this man appeared to enjoy it, and he generally required several doses before he had sufficiently recovered to thank the generous public for the money they placed in his pockets and hands. That man was a genius in his way. His acting was perfect, and in the early stages of his career he must have carefully studied the movements of some poor sufferer who had fits badly—and often.

Another man was well known in his day as the "funeral beggar." If half the tales he told had been true he would have been the most afflicted man known to history. He was always having funerals. Like the prosperous undertaker, he waxed and grew fat on them. According to his own account he must have had a sufficient number of children to fill the largest Board School in London. And he buried them all, or rather begged the money for that purpose, which was more satisfactory from his point of view. The number of wives that man had was simply

WHEN NOT BEGGING SUCH A MAN IS USUALLY ASLEEP

At present he is leaning against a cart. As a rule he is propping up the side of a public-house. If you whisper the word "copper" to him you will at once arouse him from his deepest slumbers

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THE WHINING BEGGAR

Always ready with a tale of woe. He finds his dilapidated trousers very useful, and he can produce a shivering fit at a moment's notice

enormous. For many years he must have buried at least one a week—or said he did. He apparently had many grandmothers and grandfathers, and numerous uncles and aunts who had made him promise on their death-beds, poor things, to raise enough money to bury them decently. But the mother-in-law was his strong point. He must have had fifty of them at the very least, and he buried them all in his stomach, for it was a bad way when he could not convert a dead mother-in-law into a bottle of gin and a mutton-chop supper. There is reason to believe that that man only had one genuine funeral, and that was his own. Although he is dead, he has many living counterparts to-day.

Some professional beggars—as we have seen quite recently—lead dual lives. They pass their days in the City, or the West End, pretending to be suffering from paralysis and other diseases, and at night enjoy themselves at music-halls and theatres prior to going to their well-furnished homes in the suburbs. Many beggars—especially those having good pitches near a railway station or a fashionable church—have been known to bring up their families in quite a respectable way on money

A WIDEAWAKE BEGGAR

He haunts the parks, and his keenness of vision often stands him in good stead

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given to them by the charitable. The most wealthy beggar I was ever acquainted with enjoyed—and *thoroughly* enjoyed—an average income of £300 a year. His was possibly an exceptional case; but many professional mendicants in London earn at least £3 a week, and are far from satisfied with that. The female beggars are, of course, quite as tricky as the men, although they are not so numerous. They generally carry infants to excite the sympathy of the public, and somehow or other—perhaps a sly pinch accounts for it—the little ones begin to cry just as ladies or gentlemen are hesitating as to whether or not they should open their purse-strings. Sometimes the infants carried by the women are not their own, but happily the practice of borrowing children for begging purposes is rapidly dying out.

Many of the men and women who sell matches in the streets are really mendicants, although of course there are some who make an honest living in this way. You can distinguish the beggar from the genuine vendor by the scornful look the former bestows on the customer who has the temerity to take a box of matches in return for his penny.

Several mendicants arrested during the past few years have had bank books in their possession. One of them had as much as £35 standing to his credit at the Post Office, and in addition to this he had a banker's draft for £110.

Some mendicants have a mania for sewing money in their garments—a shilling here, sixpence there, and half-a-crown somewhere else. It once took two constables half an hour to cut money out of the clothes of a beggar who, judging from his outward appearance, had not got a penny in the world. With the money he had concealed about his person he might have purchased several suits of clothes at a fashionable tailor's; but a ragged coat suited his purpose far better. Some men of this class would not wear a shirt unless they were well paid for doing so. There is nothing like a bare breast—especially when a keen wind is blowing—for bringing in the coppers.

Many well-known mendicants have in their early days occupied good positions. Several of them have held a fairly high rank in the Army. One old fellow charged a year or two ago with soliciting alms was at one time a wealthy man, and contributed largely to the erection of a church.

It will not surprise any one to learn that children are often sent out by their parents to beg. At one time the practice was very common, and boys who had been compelled to beg did so from choice when they became men, and so it went on from generation to generation. Nowadays, however, children found begging in the streets are promptly taken from their parents and sent away to school. In the course of time this new departure will have a very beneficial effect. Of course the parents have to contribute towards the support of their children while they are at school.

GENERALLY WARMLY CLAD

But badly shod. His statement that he has done no work for years is perfectly true

Professional mendicants, by the way, are very superstitious, and often carry pieces of coal about with them in the belief that it brings them good luck.

One artful dodger, well known in the West End, used to carry a basket containing a bottle of coloured fluid. Then he would stumble

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against a lady, fall, and break the bottle. Immediately he rose to his feet he burst into tears, and, with heart-broken sobs, explained that the medicine was intended for his dying wife. Of course the lady would take compassion on him, and give him money for more medicine. As soon as she had disappeared the artful fellow would take another bottle of coloured water from his pocket, and repeat the trick in another street.

Men dressed as sailors, although they have never been to sea, make a good living, for we all love Jack. Then there are the men who declare they have met with serious accidents in a colliery, although in all probability they have never been near a coal mine. They generally do well, from their point of view. Some professional mendicants are very fond of backing horses. A few years ago a well-dressed man, about forty years of age, gave a champagne supper to some of his lady friends, and during the night was locked up for drunkenness. On the following day he was identified as a well-known beggar who was in the habit of being wheeled about in a barrow with an organette.

Some of the men who wear shades over their faces and profess to be blind have very good eyesight. One of these impostors is very fond of reminding passers-by that "the Lord loveth a cheerful giver."

Crutches are often used by impostors who are sound in mind and limb, and the police know, to their sorrow, that when their owners get drunk they sometimes use them as offensive weapons. Men who are fond of calling attention to their empty coat sleeves often have one of their arms strapped across their chests. One impostor actually lost the use of his arm through having it constantly strapped in this way.

It must not be supposed for a moment that all people who solicit alms are impostors. There are some deserving cases, men and women willing to work, if they could find any one to employ them, being driven, by stress of circumstances, to beg their bread in the streets. When the police know of a case of this kind they often look the other way, and have even been known to share their supper with the poor creatures they ought, strictly speaking, to lock up. It is these deserving people who make it so difficult to deal with the undeserving ones. Many of the public would rather waste money on three impostors than run the risk of letting one deserving man go unrelieved. It is this indiscriminate almsgiving which enables the professional beggar to thrive, and encourages him to regard work as something altogether beneath him. It was always so, and will probably remain so until the end of the chapter. It was Charles Lamb who said: "Shut not thy purse-strings always against painted distress. When a poor creature, outwardly and visibly such, comes before thee, do not stay to inquire whether the seven poor children in whose name he implores thy assistance

A TYPICAL BEGGAR

He excites the compassion of gentlemen leaving their clubs late at night

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have a veritable existence. Rake not into the bowels of unwelcome truth to save a

A RAILWAY STATION BEGGAR
This old lady is always thirsting for a cup of tea

ha'penny." The evil of indiscriminate almsgiving was recognised centuries before Lamb was born. As early as the twenty-third year of Edward III. the public were forbidden, on pain of imprisonment, to encourage beggars in their sloth. Henry VIII. sent beggars to the whipping-post and the stocks.

In the reign of Edward VI., a confirmed vagrant was branded with the letter "V" on the right cheek, and he was assigned, as a slave, for two years to any one who chose to have him. If he ran away from his master he was branded on the other cheek, and if he again deserted his employer he was put to death as a felon.

In these days we, of course, treat vagrants far more mercifully. For a first offence a beggar is generally imprisoned for one day, which is practically no punishment at all. If he persists in begging he may be imprisoned for three months as a rogue and a vagabond. For subsequent offences he is sent to the Sessions as an incorrigible rogue, and is almost invariably sentenced to twelve months' hard labour. The chairmen of Sessions have power to order incorrigibles to be birched, but unfortunately they do not often exercise it. What the incorrigible rogue really requires is the birch, and plenty of it, well laid on. Many of them have been sent to the Sessions time after time, and invariably come up smiling. One of them has actually declared in open Court that only fools and horses work.

The impulse to give is a natural one, and no doubt we have all experienced it more or less; but it is a foolish one, nevertheless. It is opposed to the principles of political economy. It saps the foundations of thrift, and certainly lends encouragement to imposture and fraud.

If we are to clear the streets and highways of beggars, indiscriminate almsgiving must be stopped. The deserving poor must be kept in workhouses or similar institutions—but not in idleness—until useful employment can be found for them outside. Incorrigible rogues, of course, deserve no sympathy. Settlements should be provided for them, with factories in which to carry on some more or less profitable work such as mat-, brush-, and basket-making; and there should be plenty of land connected with each place for farming and market gardening. To these settlements they should be committed for an indefinite period, and be compelled to work out their own salvation. In all probability they could earn their living in this way, especially if the Settlements were run on the principle of "No work, no food." After a year or two an apparently penitent man might be allowed out on licence, which should be immediately revoked if he relapsed into vagrancy.

The scheme is not an ideal one, but I know no one, even among those who have studied this question for years, who can suggest anything better.

AN AREA BEGGAR
He easily recognises a good-tempered cook—when he can find one

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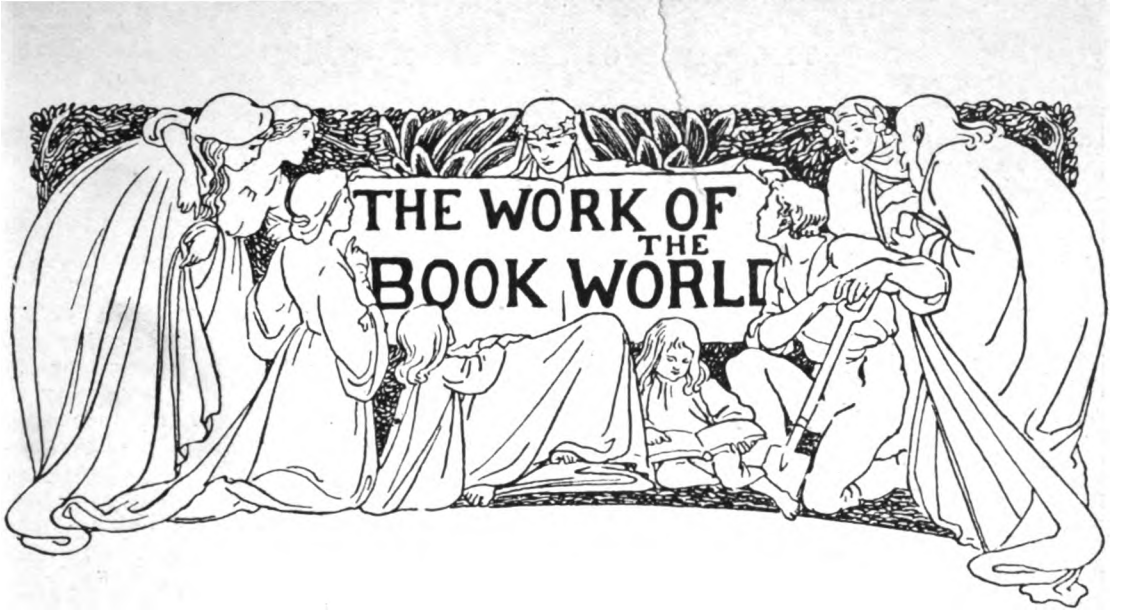

LONDON, *April* 10.

TWO books which reach us this month almost simultaneously and from the same publisher are so indicative of a certain hopeful strain in English public life that they well deserve appreciative notice. One hears so often of the decay of what used to be called the "governing classes" of England that when new scions of this stock set out upon the path made by their forefathers, those who believe in government by the classes have cause for fresh hope. It has become a fixed tradition that young men of the first families should give proof of their interest in the affairs of State and their worthiness to participate by publishing volumes upon various political subjects, volumes received in the spirit above indicated rather than with all the seriousness their young writers assume. The Government of to-day is filled with men who have made names for themselves in youth as political students, capable at least of intelligently writing down their thoughts and theories before they were called to the more active and practical duties of administration. Leaving aside any question that the books before us were written to forward candidacies for preferment, it may be broadly stated that where offices are to be distributed they are most likely to be given to promising young men who have thus shown evidence of incipient statesmanship.

MRS. ELINOR GLYN

A portrait from "The Vicissitudes of Evangeline," reviewed on page 558

The Certainties of Youth

There is usually a period in the life of every young man who thinks and writes when he delights to settle for himself, and for whatever readers may come to his pen, the intricacies of international affairs. Only the inexperienced brave the difficulties of world-politics with definite assertion—assertion that goes easily unchallenged for lack of absolute proof of the inner workings of diplomacy. Much, therefore, may be forgiven

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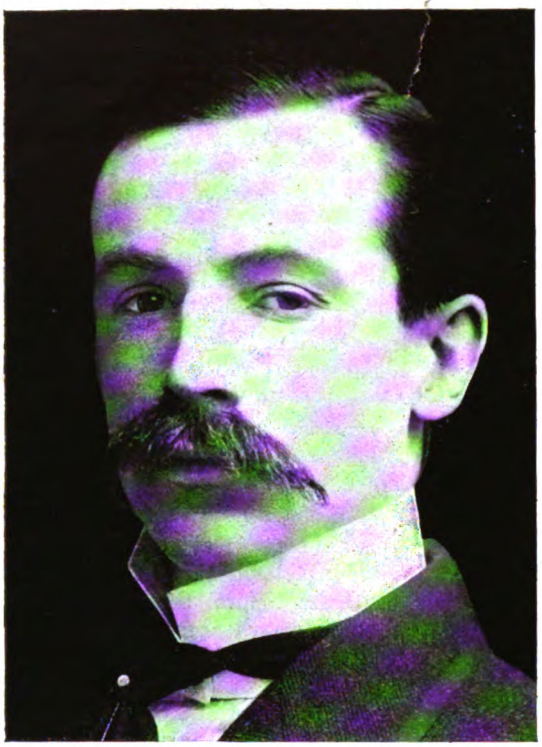

HON. GEORGE PEEL
("The Friends of England")

the young philosopher who disposes of the hopes and aspirations of the great nations of the world in a way that would surely astonish their rulers if perchance his *obiter dicta* came to their notice. Perhaps the safer method for the young writer to adopt is that of political biography, which makes up the less able book of the two in question. At any rate, the Hon. Edward Cadogan, in *Makers of Modern History* (Murray, 8*s*. net), calls his studies of Napoleon III., Cavour, and Bismarck, but "light sketches, stimulating rather than satisfying curiosity." It is, perhaps, natural that these quite clever and acceptable historical studies should remind the reader of college theses, of a kind which must be written by most young men at universities. Mr. Cadogan has a pleasant, unaffected style, and has evidently fallen victim to many of the special fancies of the youthful historian. Both of these young authors, in fact, seem particularly fond of quoting and referring to Machiavelli, who appears in each of the volumes as the still presiding evil genius of statecraft. But Mr. Cadogan's book deserves and will afford pleasant reading. Here, for instance, is a brief estimate of his first subject:

"Without exaggeration it may be affirmed that the career of Louis Napoleon is one of the most remarkable in history. It is all the more remarkable because he was a man of distinctly mediocre character, of not unusual ability, and possessed of few of those qualities which constitute a man great in the ordinarily accepted interpretation of the word.

"True it is that he was endowed with one eminent advantage from the outset of his career, and he made the most of it. The glamour of his name doubtless contributed in a large measure to his ultimate success, and aided him while striving with the sea of troubles which threatened many times to overwhelm him; yet had it not been for that dogged determination which always constituted the most distinctive feature in his character, he never could have attained the zenith of his ambitions. Moreover, without being endowed with any remarkable intellectual qualities, without exhibiting any particularly able characteristics, he was, at the outset of his career, shrewd enough to seize upon the opportunities that fortune placed in his path; and it should be remembered that fortune rarely offers to mankind anything else than the occasion for carrying designs into effect.

"Louis Napoleon early in life discerned this, and acted accordingly; but above all things he

MISS JANE BARLOW
("By Beach and Bogland")

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believed that a great destiny awaited him, and it might almost be said of him that he was possessed of that faith which we are told in the Scriptures can move the very mountains themselves. . . .

"Louis Napoleon loved power for power's sake, and this undoubtedly was the worst trait in his character. The circumstances of his career have served to heap upon his head a mass of unjustifiable slander of which we can readily acquit him, but his true nature must ever remain somewhat of an enigma to the historian. Beneath a certain depth in his character it is impossible to probe. He seems to us a fatuous man of dreams, but although he is not the only man in history who has dreamt his way to power, there are few who, like him, have built such castles in the air and subsequently placed them on foundations, unstable and incomplete though they may have proved to be. No one, however enthusiastic, with any justification can presume to compare him with his great predecessor; but contemporary critics were too apt to despise his character and to pour contempt upon him as a moody exile, as a mere charlatan and a freak of fortune. They were too ready to scoff at him as '*ce faux Napoleon!*' the sport of European Powers. A close study of his career will reveal much that will demolish such a verdict, and although it may serve as a warning to the adventurous in statecraft, it cannot fail to leave a conviction that, with all his glaring faults, he has suffered at the hands of hostile critics more than the circumstances of his life seem to justify."

From the wrecker of Imperial France to the builder of Imperial Germany is but a short step, and the author has had much recent Bismarckian literature to guide him in his appreciation of the great German. In fact, he says:

"The truth of the matter is that the German people as a whole held his name in such reverence that they became insensible to his demerits, and, while they ignored all that was defective in his character, attributed his political errors to the irresistible force of circumstances, and entertained no scruple in giving publication to his most questionable actions, construing all, good or bad, to be for the lasting welfare of his Fatherland. His faults, then, are either excused or forgotten, owing to the willing credulity and enthusiastic veneration which the most discerning of his countrymen agree to pay to the nation's idol. In the art of inspiring large masses of human beings with confidence and attachment hardly any statesman has surpassed him, and he acquired a popularity which few have more merited, and to which still fewer have attained. The result has been welcome to the biographers of this generation, as there is now within the reach of all much material of vital importance to any history of the nineteenth century. Doubtless the more sober judgment of future historians will not permit an excess of enthusiasm to bias a criticism of Bismarck's career. The attempts to whitewash his character and to slur over his shortcomings will become more and more futile, but whatever subsequent history may have in store for its final verdict, posterity will never be able to deny that the most remarkable feature in Bismarck's character was the immutability of purpose, the unflinching and unsparing energy with which he devoted himself to his great life-work.

"The story of his public career will stand for all time as a conspicuous example of a statesman who, by an indomitable force of will, hacked his way through all opposition fearless of unpopularity and heedless of the limitations imposed by conventional moralists, while it will ever be remembered that he earned his great and enduring reputation by means of eminent services rendered to his country. Future historians, then, while they must justifiably lay stress upon his faults for the benefit of those patriots whose hysterical enthusiasm blinds them to the truth, will pay a high tribute of honour to the man who, having set himself a stupendous task, succeeded in freeing his country from extraneous influence, and giving to it that strength which can only be derived from union."

It is characteristic of the young student of affairs that he should be unable to avoid current issues, and Mr. Cadogan devotes some space to Bismarck's fiscal policy. This is interesting only as it throws sidelights upon the Chancellor's ideas of England:

"In these political questions science sometimes rides such a very high horse that it fails to see the ground over which it is riding. Bismarck believed the whole theory of Free Trade to be wrong. He declared that England could step out of the barriers of Protection as it had done, 'like a gigantic athlete to challenge the world,' because she had become so powerful under the Protectionist *régime*. Free Trade is the weapon of the strongest nation, and England had in the past protected herself against foreign competition with exorbitant protective tariffs until her industries had become so powerful. It is of more than passing interest to Englishmen to observe Bismarck's never-to-be-forgotten utterance in 1879: 'England herself is slowly returning to Protection, and by-and-by she will take it up in order to save for herself at least the home market.'"

The Case for Imperialism

In the sense that it is much more original and moved by a logical line of argument, however one may disagree with its basic hypotheses, *The Friends of England* (Murray, 12*s.* net), by the Hon. George Peel, demands weightier consideration. Mr. Peel appears here as the

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champion of that latter-day imperialism of which Mr. Chamberlain is the high priest. The book is correlative to a former volume reviewed in these pages called "The Enemies of England," and is dedicated by gracious permission to His Majesty the King, who appears later in its pages as "a Monarch of whom history will record that he conciliated our enmities and consolidated our friendships, by that genuine love of peace which he shares so profoundly with his subjects, and by that royal diplomacy which is all his own."

Many readers will part from agreement with Mr. Peel in the very first chapter, where he lays down "The Causes of Empire"; and failing to concede these premises, naturally, the argument in the whole of the following book is read only with the interest which accompanies mental opposition. Mr. Peel best states his own case as follows:

"Continental thinkers, so far from regarding our Empire as the result of chance, esteem it to be the fruit of the most considered and calculating policy. Many persist in crediting us with the most resolute and unscrupulous determination to annex any portion of the globe upon which we can lay our hands. Thus one of the most recent and most learned students of our policy, the head of the school of political science in Paris, points to our 'insatiate avarice' and stigmatises our statesmen as all alike in 'rapacious ambition.' We simply trample on other races in our haste to be rich, and greed is the animating principle of our machinations. Which of these accounts is correct? The answer is, neither. Our statesmen have been neither so inconsequent and thoughtless, nor so Machiavellian as they represent. The real truth is, on the contrary, that for several centuries we have been confronted with a serious danger, to meet which our statesmen have striven to construct an Empire on a reasonable and legitimate plan. Some of them, no doubt, have been obtuse, and others have been sinister. But, on the whole, they have neither been so blind nor so malignant as their critics of the two classes respectively suppose. Endowed with no more foresight or insight than is to be found among the ordinary rulers of men, they have seen a peril and have provided against it. For instance, a retrospect of three centuries carries us back to 1604. In that year Robert Cecil, who at that date occupied a post corresponding to the position of Prime Minister, spoke 'with heat' to the Spanish ambassador. He said that England could not possibly allow the Indies, East and West, to be closed against her by the power of Spain, and he added that at no price would he allow his countrymen to be excluded from the New World.

"The view of Cecil was also that of his contemporary, Bacon. To the mind of the latter, 'nothing is more manifest than that this nation of Spain runs a race of Empire when all other states of Christendom stand in effect as a stay'; and, again, 'Spain hath an ambition for the whole Empire of Christendom.' Accordingly, to counteract and defeat this danger, it was to be hoped that 'King James I. will put a hook in the nostrils of Spain and lay a foundation of greatness to his children in those West parts.' In fact, a British Empire was necessary to bar the progress of the colossus of Spain.

"The argument in the present volume is that such a resolution as this of Cecil and Bacon, operating now against Spain, now against France, now against Russia, now against Germany, according as each Power proved for the time being the most threatening, has produced that series of annexations termed the British Empire. In other words, that Empire is the fruit of long, deliberate, persistent, and conscious effort on the part of our statesmen to avert the predominance of any European Power. If this be so, then the policy of England, whether in the old world of Europe or in the continents without, stands explained as one coherent and consistent plan. Her maintenance of the balance of power in Europe and her construction of an Empire in the other continent have been two aspects of the same design."

Mr. Peel traces the growth of the Empire through its various ups and downs, its disruption in the eighteenth century and its consolidation in the nineteenth, but the chief purpose of his book relates to the international situation since 1870. Surely since this time Continental empire-builders have been actuated almost wholly by the desire which he attributes to English Imperialists. And futile indeed have been their efforts to locate here and there about the world small obstacles in the way of our absorbing growth. Granted his premises, however, supported with many arguments and examples, he tells an interesting story of the growth of nationalism and imperialism following the idealistic days of the middle of the last century. Often he reaches a height of eloquence which can but carry the reader along, even in hesitating agreement. In the chapter entitled "America: Rival and Friend," he says:

"The broad and general argument of these pages has been that England has organised an Empire in order to preserve the balance of power in the world. Thus it has come about that an equilibrium has been, in normal times, fairly established. On the one hand, at any given moment, are ranged ourselves and any allies,

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such as Japan, whom the circumstances of the moment may furnish to us; while, on the other, in opposition, stands the would-be conqueror, such as Russia or Germany, with its allies. It is clear, therefore, that if any new Power, allied with neither of these two courses and of the immense capacities of the United States, were to step forward and throw its weight into either side of an equilibrium, it is that Power which would largely control the world. This, then, is the direction in which the policy of the United States, if wisely conducted, will move in the future, and indeed is already moving in the Far East, where, as time proceeds, she will be seen ever more clearly to hold the scale. . . .

"In the very darkest hour of English history, when the provisional oracles of the treaty which was to register the disruption of the Empire had been signed at Paris, the House of Commons passed a resolution which may be not unjustifiably described as one of the best and wisest in its long history. In that season of eclipse and earthquake, when those who had sprung from England had revolted from us, and had allied with the bitterest of our enemies, our legislature placed on record that 'We most ardently wish that religion, language, interest, and affection may yet prove the bond of permanent union between the two countries.' That aspiration must have been as hard for them to frame in that season of defeat and bitterness as it would be easy for us to endorse and forward it. For we can see before us the advent of a time when Burke's noble prophecy should be not impossible of fulfilment, a time when, in spite of the inevitable rivalries of two great nations, 'the Americans will have no interest contrary to the grandeur and glory of England,' and when 'the more they multiply the more friends we shall have.'"

The Great Commoner

If library gossip is to be credited, the publishers of the series had some difficulty in securing an author for the last volume of their series of Twelve English Statesmen. The appearance of the volume upon *Chatham* (Macmillan, 2*s.* 6*d.*) by Mr. Frederic Harrison puts an end at least to the rumour that Lord Rosebery was to supplement his monograph upon Pitt by a further study of Pitt's great father. However much one may delight in the scholarly achievements of Mr. Harrison, one may doubt if he was the happiest possible selection for this task. Mr. Harrison may sympathise as a Liberal with the Whig principles of the Elder Pitt, but he is essentially a politician of the closet, whereas his subject was all in all a man of action. Pitt's own sister said he really knew nothing accurately save Spenser's "Faery Queen." It is doubtful if the scholar can ever quite appreciate or entirely condone the defects accompanying the virtues of successful political leadership. Yet there is much to be said in praise of the way Mr. Harrison has carried out his task, necessarily restricted as he was by space. For the great life of Chatham yet remains to be written, and one may hope that Lord Rosebery will some day complete, in a form unhampered by the restrictions of any series, the full and free life of the great Commoner upon which he has been variously reported to have embarked.

With the Wild Flowers

The simplification of photography has worked wonders in the popularisation of science. The heavens have yielded up from their depths a myriad of stars invisible to the eye but caught and fixed by the sensitive plate. The infinitesimal mysteries of the microscope are laid bare and permanently delineated. The hunter now goes armed with a camera in place of a gun, and his trophies show the wild joy of living rather than the traces of destruction. In all fields of Natural History the camera lends its aid, even the wonders of the deep are revealed. A new and what promises to be a successful series of camera natural studies is to be published in fortnightly parts under the title of *Wild Flowers Month by Month* (Warne, 8*d.* net each), by Mr. Edward Step, F.L.S. The illustrations to accompany each of the twelve parts are taken from the flowers growing in their native haunts, and will follow the face of nature through the year. The first part, about the flowers of March, is altogether attractive, showing us the aspects of March in the woods, March on the chalk hills, and March on common and riverside.

A Knight Errant in Bookland

Surely it is ungracious to review a review, yet it would not do to pass over without notice such a delightful volume, delightful most of all to readers of bookish habit, which Mr. Andrew Lang calls *Adventures among Books* (Longmans, 6*s.* 6*d.* net). Not long ago in these columns we were quoting Lord Salisbury upon the ideal attractions of Richmond portraits. The one of the great Bookman which serves as a preface to this volume of Mr. Lang's resuscitated reviews is of a genial character, entirely in consonance with the character of the book. Perhaps the most delightful of the essays is the first one, which gives its title to the book, and tells of Mr. Lang's early experiences as a literary Columbus. The reminiscences of Robert Louis Stevenson touch a more recent

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period and add little to our information upon a much-discussed subject. Mr. Lang is at his very best in the essay upon "Rab's Friend," for there are few of us who are not ignorant of and do not desire a better acquaintance with Dr. John Brown. Needless to say, Rab's friend is also Marjory Fleming's friend, and the trio are inseparably linked in British hearts. Here appears again the well-known attempt to revive the glories of Mrs. Radcliffe's novels, beginning with the well-known sentence:

"Does any one now read Mrs. Radcliffe, or am I the only wanderer in her windy corridors, listening timidly to groans and hollow voices and shielding the flame of a lamp which, I fear, will presently flicker out, and leave me in darkness?"

Since this tribute, the literary daughter of Horace Walpole has gone almost wholly neglected, and we fear that although she kept the Lamp of Romance burning in her time, and during the lengthy period of her popularity, her own light has now gone out for ever. One could wander at great length in the charming maze of letters which Mr. Lang presents here, all tricked out with the beauty of an old-time garden, with many quaint and curious blossoms of forgotten form. But even the blossoms seem like pressed flowers found in some long unopened volume, rather than blowing with whatever little life so tender a gardener as Mr. Lang could nourish in them.

The Love Affairs of an Empress

If one is to believe the French writer, Monsieur de Laribière, when he holds that Frederick of Prussia, Maria Theresa, Catherine the Great, and "King Voltaire" were the real masters of the eighteenth century, it is not surprising that so many volumes should continue to be written about them. And, as the writer of this latest contribution holds, Catherine is easily the most attractive of them all. French writers surely have done their duty by the great German woman who so ably shaped the destinies of modern Russia, but in England she has been strangely neglected. This may be for the very same reason which causes Mr. Philip Sergeant to characterise euphemistically the chief influences in her life as *The Courtships of Catherine the Great* (Laurie, 10*s.* 6*d.* net). Mr. Sergeant has written a work which should be very popular with those thousands of readers who delight in the love affairs and scandals in Royal archives, a class of books of which there have been many successful in recent years. Mr. Sergeant has a pleasant style and does not bore the reader with too many or too intricate details of Russian history in what Mr. Havelock Ellis calls "the most human century." His book remains what it starts out to be, only a description of certain aspects in the life and character of the great Empress.

Fascinating Frenchwomen

There seems an inexhaustible supply of material for the making of attractive books in the lives and careers of the famous women of the French *salons*. Even if one holds that the last word has been said about them, that Sainte Beuve, for instance, has made the task of his successors seem almost impertinent, one is yet loth to pass over a new collection of anecdotes concerning these charming subjects. Although *Dames and Daughters of the French Court* (Unwin, 6*s.*), by Geraldine Brooks, is plainly of American origin, these famous ladies are so much the property of the world at large that the point of view from which they are treated matters little. Included are appreciations of Madame de Sevigné, Madame de la Fayette, Madame Geoffrin, Mademoiselle de Lespinasse, Madame Roland, Madame La Brun, Madame de Stael, Madame Récamier, Madame Valmore, and Madame de Rémusat. Each of these also appears in an attractive portrait, either reproduced from old paintings or still more attractive engravings. Mrs. Brooks has been very careful to place before us her heroines as they appeared to the eyes of their contemporaries. Those of us who read and delighted in Mrs. Humphry Ward's "Lady Rose's Daughter" will be particularly interested in the essay devoted to the acknowledged prototype of Mrs. Ward's heroine. The career of Mademoiselle Julie de Lespinasse here given very closely accords with the plot of the novel; but more interesting, as being more of her character in this galaxy, is her appearance as mistress of the famous *salon*. Here is how she is shown as a hostess:

"Mademoiselle's slender means would not permit her to give suppers like Madame Geoffrin, Madame Necker, and the other salonists of the day. But every evening from four to nine o'clock she was at home, and not for all the feasts of the Maecenases of her time would Mademoiselle's friends have missed her festivals of intellect, grace, and elegance.

"Mademoiselle's *salon* was more intellectual than Madame du Deffand's, more aristocratic than Madame Geoffrin's. It was characterised above all else by variety. In every other *salon* there was some ruling spirit. In Mademoiselle's not even

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D'Alembert was any more than an ordinary visitor. There was in Mademoiselle's *salon* a place for every person, a chance for every topic of conversation; politics, religion, philosophy, anecdotes, and news all contributed to the entertainment of the company.

"Marmontel has compared Julie's management of her *salon* to the wand of an enchantress. A word, lightly thrown in, apparently without effort, she could change the talk, direct it at will, exciting it or modulating it as she desired. 'Under her guidance,' he said, 'the variously assorted, widely differing members of society fell into harmony like the strings of an instrument touched by an able hand. She played the instrument with an art that came of genius. She seemed to know what tune each string would yield before she touched it. I mean to say that our minds and our natures were so well known to her that in order to bring them into play she had only to say a word.'

"Grimm wrote similarly of Julie's ability as mistress of her *salon*. 'She possessed,' he said, 'in an eminent degree that art so difficult and so precious of making the best of the minds of others, of interesting them and bringing them into play without any appearance of constraint or effort. No one knew better how to do the honours of her house. She had great knowledge of the world and that species of politeness which is most agreeable; I mean that which has the tone of personal interest.'"

Perhaps the most brilliant, one almost might say fiery, character of the lot is that of Madame Roland, goddess of the French Revolution. Here one gets out of the atmosphere of artificial society and literary *dilettanteism*. One comes to the fierce spirits who brought about the Reign of Terror. There is one striking picture of a meeting of Jacobins in the Hôtel de Britannique, where Madame Roland was present, quietly writing at a table, apparently ignorant of the dilatory and rather futile discussion going on about her. Even when their arguments came to an end, no one would have imagined that she had been listening or paying attention to what was said.

"The gentlemen were leaving. One by one they stopped beside Madame's chair to exchange a few words with her before departing. At length there remained only Brissot, Robespierre, Petion, Buzot, and Roland. These latter gentlemen, left alone, turned to Madame Roland, anxious for her opinion.

"'Well, what do you think of to-day's business?' they inquired. 'Do we go backward like the crab or slowly forward like the turtle?' This was said part in jest and in appreciation of the woman's swift, eager spirit.

"Madame Roland pushed back her papers and rose from her table. Impetuously, a bit scornfully, determinedly, she faced the men. 'You are nothing but children,' she exclaimed. 'Your enthusiasm is a momentary blaze. A civil war is necessary before you will be worth anything. 'Tis blood we want, since nothing else will whip you and make you go. War! war! We must beat to battle or retreat. There is no middle course.'

"Something like the joy of battle thrilled in Madame's voice and shone in her eyes. She was terrible in her cruelty, but in her cruelty, its cause, its very essence, was the divine spark. Her wrath was 'the wrath of the gods,' her indignation the 'righteous indignation' of the moralist. Her call for 'blood' was in accordance with that 'divine right of insurrection' which she preached, a means towards that 'complete regeneration' which she most rigorously demanded."

A Kentucky Chevalier

By this time English readers have, no doubt, ample acquaintance with the charming work of Mr. John Fox, whose last long novel, "The Little Shepherd of Kingdom Come," had such a wide sale in this country. In his latest book, *Crittenden* (Constable, 6s.), Mr. Fox again takes his reader to the delightful Southern homes of the Blue Grass country, but not to the even more attractive regions in the Tennessee Mountains. It is a story written round and about the Spanish-American War, and tells how through a new birth of fire and blood a young Kentuckian was reclaimed from dissipation and indifference to a life of purpose and the reward of love. Mr. Fox appropriately names his hero after a Kentuckian who died in one of the earliest efforts for the liberation of Cuba during the fifties. His descriptions of the American expedition to Santiago, and of the fighting there, are obviously those of an eye-witness. Some of the battle pictures remind the reader of the work of the late Stephen Crane, but when Mr. Fox returns to Kentucky he is again in a land which he has made peculiarly and charmingly his own. *Crittenden* can be cordially recommended to readers of nearly every class.

A Story of Scottish Lovers

Mr. Charles Lowe has written a stirring Franco-Scottish romance in *A Lindsay's Love* (T. Werner Laurie, 6s.). With such elements as are supplied by events in Paris before and during the Siege; a young Scotsman in the midst of these events for hero, and the girl he left behind him for heroine; a first-class palmist; and a "plot" against he third

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Napoleon, so versatile and well-informed a writer as Mr. Lowe could hardly fail to interest his readers. Mr. Lowe certainly succeeds. Not that the reader's sympathy is always with the hero. His sensitively suspicious interpretation of Margaret Gordon's presence in Paris and her recognition by the Emperor, will rather gain for him a character for stupidity. But he redeems his great blunder brilliantly by his exploits as a spy who enters the German lines, and miraculously escapes being shot for his pains. For these exploits lead him eventually into the hands—or rather the arms—of his faithful cousin and sweetheart, who has all the time only been a companion to a great Scottish lady in Paris. Everything ends happily, to the accompaniment of domestic peace and a return to parents and guardian who had been mourning the two young people as lost. Lindsay's adventures in the German lines, where he meets an old schoolfellow, are especially vividly told, but the whole story is vivid, humorous, and engrossing.

Depravity in High Places

As long as plays like "The Walls of Jericho" secure crowded houses for hundreds of nights, just so long will the novelist seek to secure the success of the playwright who reveals the depths of "hupper circles." Clearly this is what Mr. Cosmo Hamilton has set out to do in his latest novel, which is called, no doubt because his hero went with other "absent-minded beggars" to South Africa, *Duke's Son* (Heinemann, 6s.). It is a horrible story of the downfall of the fine brave young man, and is very well told, in a way to puzzle the moralist. By easy stages and quite to the quieting of his own conscience Lord Francis Delamere came to the conclusion that since his father the Duke refused to make him a proper allowance, and since society demanded that he should live up to a certain standard far beyond his means, society should be compelled to pay the bill. Therefore he cheated at cards. He began his cheating with a friend, the partnership pursuing its profitable course in London and in country houses. Even after this, Lord Frankie retains sense of decency enough to refrain from making love to a nice girl whom he would otherwise have asked to be his wife. By mere chance he caught her in one of the little and comparatively innocent subterfuges which some women use at cards, and made this discovery a basis of proposing for her hand in marriage and of making her his partner in his criminal career. The author seems to have wavered in his mind as to the final retribution which he should bring upon the heads of the young couple, for after starting out with the evident intention of killing them, he repents and merely puts out the eyes of his hero, while bestowing upon him the unexpected and unmerited inheritance to the dukedom with its great rent-roll. The charm of the book lies in the living presentation of this young man and his wife—criminals as attractive as ever graced the pages of sensational fiction.

An exposition little less cold-blooded and certainly more heartless is that made by the *Confessions of an Ambitious Mother* (Heinemann, 6s.). One has come to expect that a book of confessions will relate so much discreditable to its author as to compel anonymity, and it may also elude the unexperienced reader into supposing that the revelations are genuine. This is a story of the struggles of a mother born in the wilds of West Virginia to land her children within the charmed circle of that cosmopolitan great world which is equally at home in all capitals. That she does so at all costs to herself, even to the loss of her provincial virtue, is brazenly set down with little excuse or regret. The book is undoubtedly based upon the careers of some well-known American families, whose sons and daughters have in their own lives risen from the depths of poverty to positions of power in the American world of high finance and on the titled summits of old-world society. This ambitious mother marries her three daughters in turn to a British ambassador, an American millionaire, and an English earl, while her son is securely placed within the ramparts of Knickerbocker wealth and genealogy. The story of her successive struggles with each child and with her often-pressing circumstances is graphically told, and easily carries the reader along in interest to the end. But no one acquainted with the lights and shades of literary composition will for a moment believe that one of the New York great ladies has unburdened her conscience here. It was a revealing error in the writer to take her heroine into the shady circles of society journalism, for her intimate knowledge of this discloses the secret of her intimacy with certain phases of life and undoubtedly betrays the book's origin.

Irish Peasant Stories

The title of Jane Barlow's new volume, *By Beach and Bogland* (T. Fisher Unwin, 6s.), delightfully suggests its nature to those who know her unerring portraiture of Irish peasant life. The lives of these people are poor and

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dull and monotonous, like the bleak, unyielding country in which they live, but an intimate knowledge discovers a native humour and pathos that varies their lives as the bogland itself is made myriad-hued by shafts of bright sunlight. As in other collections of stories, some of the gem-like setting is dimmed because they are collected. They are meant to be solitaires. This applies less to the essentially humorous, perhaps the best of which is the "Widow Farrell's Wonderful Age." The inhabitants of Clochranbeg who prided themselves on the fact that "there are few places where people are apt to be getting their health as well" were made jealous to hear that at the neighbouring village of Stradrowan one Mrs. Julia O'Meara had had her hundredth birthday celebrated with every sort of grandeur you could give a name to. This seemed a direct challenge to the Clochranbegians to produce an equally aged inhabitant, and while this was being discussed at Mrs. Doherty's the Widow Farrell looked in on her way to Geary's. Here she listened to the newspaper account of the centenary:

"'The vener'ble re-ciperant of the prisentation retains a vy-vid remimberance of the fateful year '88, the landin' of the Frinch, the battle of Watherloo, and other historiogical evints, which she graphically relates to her interested audithors,' Mrs. Hickey slowly spelled out of the smudgy column. 'But sure, there's plenty here in Clochranbeg could remimber that much, and maybe more, if they gave their minds to it.'

"'What 'ud ail them to not?' said Nannie Phelan. 'I've a good few things in me own recollection, and as for Mrs. Farrell, that has a heavier age on her than any of us here, ma'am, she had a right to remimber all manner. But there's no talk of presintin' her wid shawls and gowns and chests of tay.'

"'Ah, not at all, not at all, why should they?' the widow said disclaimingly. 'I'm a dale short of a hundred yet anyway.'

"'Might you happen to mind any talk of the war and the Frinch landin', ma'am?' Mrs. Hickey inquired of her.

"'Sure, I'm hearin' talk of it all the days o' me life, for that matter,' Mrs. Farrell said. 'But the war I've most recollection of was an American one, for it lasted a cruel long while, and the prices there did be on everythin' would frighten you. A shillin' for a little weeny taste of tay you could put in a half eggshell. Sorra a sup of it any poor person seen those times, and everybody said 'twas the American War made it so dear.'

"'A drop of tay's a woful loss,' Mrs. Doherty said. 'There's nothin' to aquil it. But how long back might that be, Mrs Farrell?'

"'Och, woman dear, I couldn't be tellin' you! It was a good while, bedad——'

"'Mr. Martin here can tell us, very belike,' Mrs. Hickey said, wheeling her stool half round so as to reach a small elderly man. . . . He was the National School teacher. . . . 'I was axin' you, could you tell us what American war there might be a great while ago had somethin' to say to the price of tay?'

"'Oh, ay, to be sure,' said Mr. Martin, 'that 'ud be at the beginnin' end of the War of Indepindence—the time a mob of people dressed themselves up like wild Injins and stepped on board of all the ships that was lyin' in Boston Harbour loaded wid tay, and every bit of it they slung into the water—hundred of tons' weight.' . . . 'Twould be before any of us was born or thought of,' said Mr. Martin. 'I couldn't give you the very date out of me head extemporaneous, but 'twas a dozen year or so after George the Third come by the crown of England. If you called it seventeen hundred and seventy you wouldn't be far astray.'

"'Sivinteen hundred and siventy,' said Mrs. Doherty. 'Isn't that ould ages ago?'

"Nannie Phelan was adding up on her fingers under her breath. 'Tin and tin is twinty, and tin is thirty,' and at the end of her calculations she said: 'I declare to goodness it's better than a hundred year, forby whatever age she was herself at the time. Is it just a slip of a *girsheach* you were then, ma'am?'

"Deed, no, Nannie, a widow woman I was then, the very same way I am now,' Mrs. Farrell said, glancing anxiously from face to face. Her three neighbours were surveying her with a sort of awe-stricken curiosity, which was not reassuring.

"'Well, to be sure,' said Mrs. Hickey, 'she looked to be an ould woman when I came here first, and that's over twinty year back. But I'd no notion she was that wonderful age altogether.'

"'Tellin' you the truth, I was noticin' her failed a dale this good little bit,' said Mrs. Doherty. 'But that's only to be expected, the dear knows, and she going on for two hundred.'

"'What way are you feelin' yourself at all, ma'am dear?' said Nannie.

"'I do be gettin' me health very raisonable,' Mrs. Farrell said, 'glory be to goodness.' But her tone was dejected enough to harmonise with the condolence expressed in Nannie's inquiry.

"'I wonder now might she happen to have e'er a line wrote down anywheres?' said Mrs. Hickey. 'That's sometimes a handy way of makin' out things.'"

In a prayer-book with the poor widow's name on it was discovered the date 1762, which speedily quenched any hope left in Mrs. Farrell's mind that she might not really be so "on-

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nathurally ould." The persistent sympathy of her neighbours in three months changed her from being a hale-looking old woman to a bent, wizened, and decrepit creature—an obvious bi-centenarian, and she would probably have died of her extreme old age, but happily a nephew turned up from America, her "own sister's son," who proved to her own and everybody's satisfaction that she was only eighty-five, that the name on the flyleaf of the prayer-book was the name of her grandmother, and the "Widdy was not so much as born for better than forty years after the war about the tay."

A Reconstruction Melodrama

Turgid melodrama has its well-defended place upon the stage. Its position in letters is a much more debatable one, and may never reach the ranks of the elect. But if there are certain subjects which at least are much more fit than others for turgid handling, surely the sufferings of the Southern States after the American Civil War is one of these. For instance, with all the skill of his better style, Mr. Thomas Nelson Page in "Red Rock" failed to impress the English reader with the utter terror of the time of which he wrote. It needs the rougher, more brutal treatment awarded it by Mr. Thomas Dixon in *The Clansman* (Heinemann, 6s.). Mr. Dixon spares no terrifying, bloodcurdling details, and yet, special pleader though he be, he has not grossly exaggerated facts in his fiction. The novel takes its title from the well-known organisation that overspread the South during the late sixties and early seventies, known as the Klu Klux Klan. There was a great deal of romance in the organisation of this latter-day order of chivalry, particularly in its protection of white women and children from the terrible danger often threatening them. And Mr. Dixon makes most use of it. But his story goes further afield than its description of the bleeding South. He gives an effective picture of Washington in the early years after the war, and atones for whatever sectional bitterness he may show by a loving and noble picture of President Lincoln. But the master-study of the book is a thinly disguised portrait of Thaddeus Stevens, the leader of the House of Representatives, the arch-enemy of the conquered South, and the master spirit of the reconstruction era. Mr. Dixon's novel is a melodrama pure and simple, but it is a thoroughly interesting tale, well told, with much more love interest involved than would be apparent from this emphasis of its political character.

International Law

The fixed Law of Nations is itself vague and unsettled, so it is not to be wondered at that popular ideas upon the subject are still more indefinite. Serious readers of political economy, particularly students of international comity, constantly come upon puzzles of legality, and often what seems a clearly defined statute in one case is quite disregarded in another. Although Professor L. Oppenheim, of the University of London, states that his new work upon *International Law; Vol. I.* (Longmans, 18s. net), is a book for students written by a teacher, it is of such elementary form, with subjects so well grouped, that it is well fitted to supply the needs of the more general reader. This first volume treats of the aspects of the law as it applies to conditions of peace. The subsequent volume is to cover the still more difficult and vague tenets of the law as applied to conditions of war. In view of the difficulties of the subject, it seems well that Professor Oppenheim has carefully sought to avoid pronouncing rules as established which are not yet settled; has, in fact, presented International Law as it is, not as it ought to be.

Pure Milk for Infants

Readers of this magazine who remember with interest the articles published upon methods used for the prevention of infantile mortality by furnishing pure milk both in Denmark and in Battersea will do well to turn for further information upon this subject to a volume by Dr. G. F. McCleary, Metropolitan Health Officer for Battersea. *Infantile Mortality and Infants Milk Depôts* (P. S. King, 3s. 6d.) is devoted largely to the work of Dr. Léon Dufour, founder of the famous French institution called the *Goutte de Lait* at Fécamp, but includes also a review of the workings of various milk depôts in England, as well as consideration of the closely related subjects of infant feeding and infantile mortality, and a chapter upon the decline of the English birth-rate. Dr. McCleary's book should take high place as an authority upon this important subject.

London City

The thirty-fifth annual edition of *The City of London Directory* (Collingridge, 12s. 6d.) contains as usual all the information concerning the City Corporation, the Committees, the City Officials and the Livery Companies for which this directory has been for so many years noted. An important new feature is the inclusion of the London County Council Committees.

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THE NEW POTATO CULTURE

THE POTATO BOOM AND ITS RESULTS TO RAISERS AND GROWERS—HOW DOES THE PURCHASER GET HIS MONEY BACK?—THE "EXPRESS" METHOD OF CULTURE EXPLAINED—SCARCITY OF STRONG HEALTHY SORTS—WANTED, A POTATO THAT WILL RESIST DISEASE

BY

HOWARD E. WARD

LECTURER ON NATURE STUDY TO THE CHESHIRE COUNTY COUNCIL

TRULY this is the age of sensations in all branches of industry, but who would credit the modest potato tuber with adding its quota to the number? The agricultural and horticultural communities have watched with interest and amazement, shared in a general way by the ordinary public, the trend of the potato boom. This may be said to have really started two or three years ago when the famous "Northern Star" appeared first before the public. Originally sold at a few shillings a pound, the boom started, and in a very short time the stock was so limited that neither love nor money could purchase it. This fairly took the breath away, but what expression must be used to describe the appearance of "Eldorado" produced by the same raiser, Mr. Findlay of Auchtermuchty, as "Northern Star"? It is impossible to say what original price this fetched, but before long small tubers no larger than marbles were bought at £4 and £5 each. This would be somewhere about £200 per pound! One grower considered himself very fortunate in procuring a stone of this variety for £1400! The great desire, apart from the growers' point of view, seems to have been to possess what others had not. There is little doubt that purchasers at this high price will regret their outlay on Eldorado, which is hardly the fine variety it was formerly supposed to be. Perhaps had they looked about them they might have found an easier way of obtaining stocks of it. It is now recognised in some quarters that a few Eldorados are appearing as "rogues" among Northern Stars. It is probable they have a somewhat similar parentage.

Judging from the numerous advertisements in the agricultural papers, the present season has not been backward in booming new varieties. Here they have appeared galore; almost each advertiser having something fresh to offer. Of course the quality is superior, and each one is the finest variety ever offered—the one to capture the market and become the real farmers' potato! One can only wonder what will be the outcome of it all. Will it mean ruin, or unheard of wealth to the different speculators? There are many who must have regretted ere this entering the potato industry, and who now would be glad to pass out of it with the profit and loss sides of the ledger equally balanced. The feverish rush to purchase new varieties, to speculate and gamble in them, has only been equalled by the mad rush to Klondyke several years ago. It is just possible that it has alike met with the same varied results.

Where, it might be asked, is the farmer going to benefit? How is he going to be able amid the multiplicity of varieties to select one for culture that will be of most benefit to him? Even when it has been purchased, how is he, out of chaos, going to be sure he has got that particular variety true to name? Well may likely buyers ask for guarantees that they are purchasing the right stuff! There is a splendid field at the present time, unlimited in extent, for the cultivation of dishonesty in the potato trade, and no doubt there are many only too ready to plough the lucrative soil and reap a harvest from an over credulous public.

There is, however, often method in madness, so likewise here there has undoubtedly been a primary reason for the purchasing of new varieties. It is due in great measure to the scarcity of good, strong, healthy sorts of potatoes on the market. This has been in the first place the true and laudable object, but this object has taken second place. That the raiser of new varieties is entitled to substantial remuneration for his work is undoubted, but the condition of things at present is beyond all reason. One raiser this season has been asking

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over £20 per pound for four new sorts, and has no doubt found many buyers. It is recorded of this same raiser that last autumn he was asked by some growers who were looking over his farm at what price he would sell a variety—Mairsland Queen—at which they were looking. £20 a tuber, the price asked, was immediately paid by those present. We must not, however, blame the raisers altogether for this state of things. The chief blame rests with the growers who force the raisers to sell before they have sufficient stock, and have to pay in consequence. It is in this way that the present boom has largely come about.

But how, the public may ask, is the purchaser going to make his money back, let alone make anything out of such precious morsels? Surely by planting in good soil of more than ordinary fertility he cannot expect more than a few pounds' yield of potatoes from each tuber. Then as the price comes down, as it will do, where is the return on the outlay? The grower, however, follows another method, one to meet the needs of the case. He undertakes what has come to be known as an "express" potato culture, a method whereby there is practically no limit to the number of plants produced from each tuber. This may be undertaken in several ways, but all are the same in principle. Each potato may be placed in a box covered with light fibrous soil, or leaf mould, moderately damp, and then kept in a warm glasshouse fully exposed to a gentle light. Very soon from each eye sprouts appear of varying strength. These are allowed to grow for a short time, producing a mass of fibrous roots. Each sprout now with root attached is taken from the tuber and potted. It is now placed in gentle heat to grow, and the old tuber is put to sprout again, and so on until the vitality of the tuber prevents any more sprouts emerging. The old tuber then is often cut up and potted, and usually produces a few plants itself. It might be thought that this is the end of the work, but this is not so. After the sprouts have grown up into fairly strong stems these are "topped" to form cuttings, which in their turn produce new plants, the old sprout meanwhile sending up new shoots which in their turn can be used as cuttings, and so on, *ad libitum*. There must, perhaps, come a time when the possibility of taking cuttings will have passed, but it is not easy always to reach it. Another method, not quite so drastic as this, is to cut down to single eyes, pot off, and then treat as in the former case. One grower confidently asserted some time ago that he hoped in the near future, by express culture, to make a pound of sets yield a ton of produce! It is easy to see now how the grower gets a return. A propagator may, say, for the sake of argument, produce 200 plants from one pound of tubers without any difficulty. Suppose each plant, when transplanted to well cultivated soil, to yield one pound of produce per plant. At this computation, one pound of sets would produce two hundred pounds of potatoes, a very substantial return. By placing the pound of tubers directly in the soil, a yield of fifty or sixty pounds would be considered good. Thus it is seen that in express culture, although each plant gives a smaller yield, the aggregate is larger than in ordinary circumstances.

This new culture, undreamt of years ago, is, then, responsible for the increase in present stocks of rare varieties. It is contended by many people—notably Mr. Findlay—that this method is bound to weaken the constitution of the variety, and so kill it before its time. Time alone will be able to prove or disprove this. It may be so, but if the plants are well grown and looked after, and planted on the right soil and given every attention, it seems difficult to see why any deterioration should result. There are many plants in the hands of the expert, notably the dahlia, which have been subjected to such apparent strains for years, yet they do not seem to be accompanied by any manifest weakness. The National Potato Society might in its infancy do worse than give its attention to this matter. That we must be constantly looking for new varieties of potatoes there can be no doubt, especially those forming the main crop. The potato has been so welded by the raisers that it has been made to give attention to the formation of tuber rather than the building up of a strong constitution. The strength required and energy needed to form such tubers is so great that the general health must eventually suffer. This great production is abnormal, and places the potato plant in an unnatural condition. Depending always upon tubers as a means of propagation is not natural to a plant which under normal conditions reproduces its species by means of seed. It is, however, very seldom in our newer kinds that we find seed produced. We may have abundance of flowers, but all, or nearly all, are destitute of pollen. The plant clearly has not the energy to tuber and form seed at the same time. Most new varieties which have been produced from seed, the natural method, resulting in vigour for a time,

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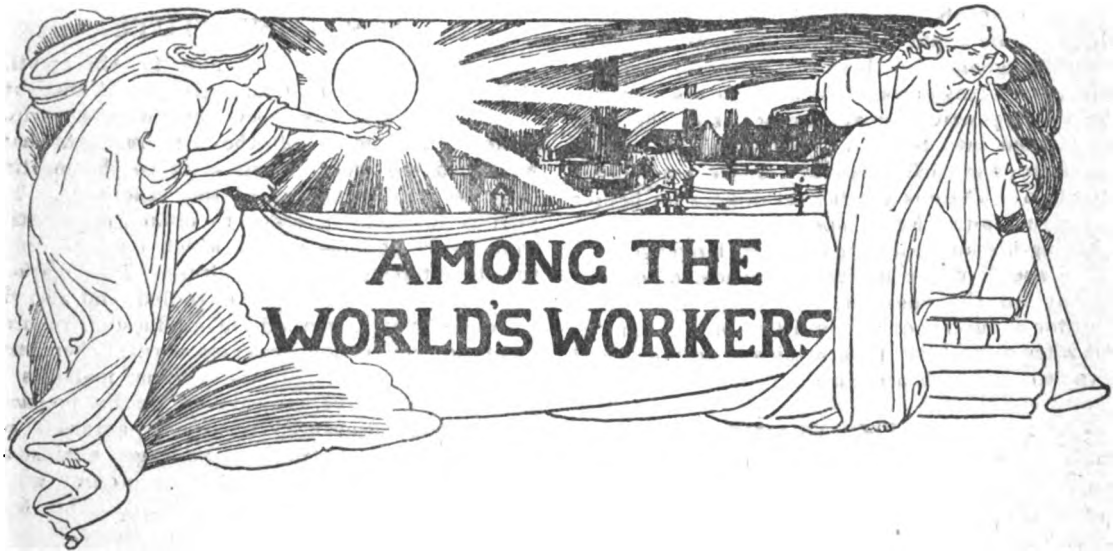
have been raised from older varieties of potatoes. those which had not reached such an abnormal state of artificiality, and so had sufficient energy to form seed. The old Magnum Bonum, if one might hazard a guess, is responsible for the parentage of many of our present day potatoes.

The life history of a main crop potato is very limited in extent, probably not more than fourteen years, when it is considered profitable to grow it. But there are many that long before this time fall a prey to the insidious potato disease—a fungus that alike attacks stem, leaf, and tuber, making each and all a rotten evil-smelling mass. As the constitution weakens, there is a splendid foothold for disease which is not slow to seize upon it. During August and September this is often in very damp weather responsible for the ruin of acres of potatoes. Early varieties generally escape the disease, and consequently their life history is much longer. It is often contended that new varieties are disease resisters, and many are the raisers who contend in their advertisements that they have at last got one which is proof against the scourge. But sooner or later all will fall a prey as the constitution weakens. The potato that will resist disease for all time has not yet been forthcoming, but when it appears it will be a gold mine to the raiser. This fearful disease is incurable; there is no remedy at present known. What a great work the National Potato Society would perform, and what a benefit it would confer on the community could it but be the means of finally mastering this terrible enemy!



A NEW USE FOR TELEGRAPH WIRES

ACCORDING to a German *savant*, Herr Bock of Babenhausen, the humming noise of the telegraphic and telephonic wires can be utilised in meteorological observations. Thanks to this noise, the changes of temperature can be told ten hours beforehand. Experiments have been made with this new theory, which it appears have proved the truth of it.

A NEW MARINER'S COMPASS

A REMARKABLE mariner's compass has been invented by a Frenchman, M. Heit. It registers automatically the route taken by the boat and the speed minute by minute. It is fixed on to a steel pivot which rests on a stationary agate. This is immersed in a basin containing a small quantity of mercury, which serves for conducting the electric current that registers all the movements of the compass. A small silver pointer is kept in electric communication with the pivot by means of a flexible wire. The index is not usually in contact with the basin, but the electric current quickly opens and closes the circuit, so that the angle of the boat with the meridian is correctly registered. The basin is divided into a certain number of sections isolated from each other, and each corresponding with a special circuit. The registration is operated by means of an electric spark. Certain sections of the basin correspond with signal bells warning the captain of every time that the boat deviates from its normal direction. In case of an accident causing a stoppage, the time of the delay is faithfully noted.

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THE HIGHEST LIBRARY IN THE WORLD

QUEEN MARGARET of Italy is building an Alpine library on the top of the Pic d'Ollen, at an altitude of over 8700 ft. It will be the highest library in the world, and is only to contain works on subjects connected with Alpine literature. Authors from various European and American countries have presented the library with their books, and the collection of photographs will be unique. The library is being built in memory of King Humbert.

A FRENCH SHORTHAND MACHINE

A NEW shorthand machine has just been brought out in France by M. Charles Bivort, and is named by him the "Sténophile." M. Bivort has based his system on the application of the ordinary printed letters, and his method of syllabic writing. By de-composing some thousands of words and dividing the sounds he has established a new alphabet of syllables which can be applied to most of the words in the French language and those of Latin origin and to most foreign languages. The machine is something like the typewriter in appearance, and the keys are divided into two rows, ten of which are for each hand, and each time a key is struck a syllable is written. There is another set of keys for figures and signs, and also a special arrangement for changing the keyboard for a foreign language.

The speed of the machine depends, of course, entirely on the operator, but according to the inventor a pupil soon writes fifty words a minute, and after some little time attains a normal speed of 125 to 150 words a minute.

IS IT THE ELIXIR?

EXPERIMENTS are now being made with a new medicine which promises to be a veritable elixir for the feeble and languid. It appears that in Turkey, Syria, and certain parts of Arabia the formic acid which is extracted from red ants is used medically. In France more than a century ago cataplasms of ants were prescribed as a cure for rheumatism and for paralysis. It is the acid secreted by the ant which enables it to carry burdens twenty times its own weight. Thanks to the efforts of M. Berthelot, chemists in our time have learnt to prepare formic acid synthetically. Dr. Garrigues called the attention of the medical world to the curative properties of this acid. Later on Dr. Clément, of the Lyons Hospitals, tried a series of experiments with formic acid on the muscular system with surprising results. Dr. Clément affirms that after two years of careful observation he can assure that "a normal subject with normal alimentary rations executing normal work does not feel fatigue as long as he takes formic acid." Dr. Huchard of the French Academy of Medicine, then made a careful study of this subject, and as a result of his experiences he is now a decided believer in this new treatment. Instead of the formic acid, he employs formiate of soda dissolved in water and taken in syrup of bitter-orange peel. The action of this is felt in less than twenty-four hours, and it is durable, as it persists eight or ten days after the medicine has been taken. The muscular force of Dr. Huchard himself increased fourfold within a week. As the tonic action was so excellent Dr. Huchard has employed the medicine in many cases and has had some remarkable and almost miraculous results, one of which was a woman of ninety-four with grippe and pulmonary congestion. In many cases of neurasthenia, diabetes, anæmia, and other maladies the action of this new medicine has been highly satisfactory. It is, of course, only taken in very small doses—three French grammes of formiate of soda in twenty-four hours.

AN INTERNATIONAL AGRICULTURAL INSTITUTE

A SCHEME is now on foot for the creation of an International Agricultural Institute. A circular has been sent to the various Powers, and most of the Governments have welcomed the idea. Rome is to be the meeting place for the organisers of this enterprise. The plan is to unite in order to obtain information from every possible source which may be useful to all interested in agriculture. The markets of the whole world are to be studied, and also the various climates, methods of production, requirements for emigration, progress of rural chemistry, the veterinary art and the various maladies of plants. Legislative projects are to be prepared for mutual insurance, transport, agrarian co-operation, and a battle is to be waged against all abuses of syndicates and against present waste caused by forces wrongly applied. The first meeting is convoked for May 28, at Rome.

A FLYING MACHINE COMPETITION

VERY curious was the recent competition of flying machines organised by the Aéro-Club of France. The automobile industry has made enormous progress, but there are not yet very many inventors of flying-machines, and it was generally thought that there would not be sufficient models forthcoming to warrant a serious competition. There were, however, in all twenty-nine inventors represented, and some of the most fantastic and extraordinary flying-machines were to be seen. There were no very strict regulations for this first competition, and any machine was admitted with a surface of at least one square yard which could carry a weight of four pounds to the square inch. Silver medals were awarded to the following inventors: MM.

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Burdin, Dargent, Henrion (Kapferer), and Peyret. The exhibition of these machines and the experiments generally excited great curiosity, and it is expected that next year the competition will be more keen.

A PIONEER WOMEN'S COLLEGE

A MEETING of the newly formed Appeal Committee and friends of Bedford College was held recently in one of the College libraries to discuss the present crisis in the life of this pioneer in the higher education of women. In this company of interesting-looking women the spring sunshine discovered many soft, bright colours and becoming hats, but there was nowhere visible that threatened terror of the early 'fifties, the blue-stocking. There were novelists, journalists, and doctors present, Bachelors of Science and of Arts, many of them old College students, all anxious to help the College in its present need.

The sum desired for the new building scheme of the College is £150,000. The lease of an important part of the present premises in Baker Street will expire in four years, and in 1928 the lease of the entire building will have run out without the possibility of renewal. As there is at present an urgent need for increased accommodation, the work of the College cannot be properly carried on if any of their dearly bought additions have to be sacrificed. Year by year the original buildings have been added to and extended to meet the growth in the number of students and of subjects taught, and this more especially since it became a school of the London University in 1898. The recent Order in Council for the Registration of Teachers has also helped to increase its work and usefulness. Bedford College is the only college exclusively for women in the Faculties of Arts and Science in the county of London, and it was the first to offer scholarships and fellowships for women; its history from the beginning is a record of the best kind of education unlimited by creed or class. A glance at the lists of names of students shows how cosmopolitan is its influence. Among the distinguished Englishwomen who have studied there at different times the name of "George Eliot" stands first.

In making a plea for public support, the Council of the College point out that their College is practically without endowments and no ancient endowments for women's colleges exist. The amount of the parliamentary grant is therefore inadequate, as it is a generally recognised fact that students' fees do not cover the expenses of modern higher education. For endowment of the College the Council appeal for a further sum of £100,000.

H.R.H. the Princess of Wales has already promised a donation to the funds, and has expressed her good wishes for the prosperity of the College. Lady Tate has offered £10,000 for a library to be called after the late Sir Henry Tate. Doubtless the public generally, apart from the special friends of higher education for women, will respond to the appeal. A special committee was appointed to discover an available freehold site in a central position in London, easily accessible from all sides. This has fortunately been found, and the Duke of Bedford, whose property it is, is willing to sell this site to the College. It is not far from other institutions connected with the University of London, so that together they would form a valuable group of academic centres, and would aid the working of the Inter-Collegiate Classes. Contributions are asked for specially to the General Fund, which will first be devoted to procuring site and buildings, and afterwards to the Endowment Fund. But if the donors wish to be associated with a particular part of the scheme, this can readily be arranged.

BRITISH TANNERS *VERSUS* GERMAN

"THAT is just the difference between this country and Germany," said the president of the Walsall Chamber of Commerce at a recent meeting. There is a moral in the observation, as will be seen from the circumstances under which it was made. The president was calling attention to a report which had been received dealing with technical instruction, especially to that part of it which described a tanning school in Saxony. He would like, he said, to see their own technical school taking up this matter on the same thorough lines, as he believed this would lead to Walsall becoming one of the principal centres of the tanning industry in the kingdom. The school in Saxony was not merely a theoretical school, because during the year they had handled no less than 1250 cow-hides alone, so that they could see that it was a thoroughly practical tannery as well as a school. The terms might be thought rather high—£10 a year for Germans, and £20 for foreigners. The report was for the year 1903, when there were seventy-six students, of whom forty-two were foreigners, coming from almost every country in Europe except Great Britain, which was not represented by a single student. The committee which governed the school was largely composed of representatives of the tanning and leather industries, and the school was thoroughly in touch with everything connected with tanning.

When the president sat down another member of the Chamber rose and explained that several years ago the Technical Instruction Committee had attempted to form a scholarship in connection with the Leeds School of Tanning. All the tanners and curriers in the district were circularised several times, but eventually the scheme fell through, because they could not get the £20 a year which would be requisite. After an experience of that kind, what was the use of talking about establishing a school of their own at a cost of perhaps £700

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or £800 a year? It seemed to him futile to ask the Education Committee to move in the matter. The previous attempt was the cause of great trouble and anxiety to the committee, but they were quite prepared any other time to take steps of this nature if the manufacturers in the town would give the necessary support; but, if the manufacturers would not help, they could not expect the ratepayers to do it for them.

"That," rejoined the president, "is just the difference between this country and Germany and other countries. Whilst German traders and manufacturers welcome these schools and do everything possible to make them a success, in England they are too conservative, and seem to look upon them more in the light of competitors rather than as the most important means of training the youth of the country for business." He did think, however, that a careful study of the German report would lead them to do something more in this matter.

A HINT TO COLLIERY OWNERS

THE British Consul at Nantes states that all the importers whom he has consulted ask that British coal sent to Nantes should be better wrought, so as to enable it to compare more favourably with German coal than it does at present, it being a frequent subject of complaint with their customers that it contains stones and other impurities, from which German coal is comparatively free. Importers also complain that they are placed at a disadvantage by some of the conditions in the charter imposed upon them by the British Chamber of Commerce, whereas the German charters are much more equitable to all concerned in the business. The importers also complain that while the Germans ask consumers to let them know exactly the description of coal they wish for, and when told, carry out their requirements with mathematical precision in such details as to the amount of humidity, volatile substances, ashes, sulphur, vaporisation, &c., the English do nothing of the kind, but just ship it off as it comes and will not take the trouble to look out for the composition which would give regular and absolute satisfaction to their clients. "The only suggestion I can give," adds the Consul in his report to the Royal Commission on Coal Supplies, "is that colliery owners should remedy these complaints."

THE CO-OPERATIVE SMALL HOLDINGS SOCIETY

THE Co-operative Small Holdings Society, of which Earl Carrington is president and Earl Beauchamp treasurer, has made an excellent start. Its membership is growing rapidly, though it has already discovered that the field for its work is so enormous that it will need a great deal of support if it is to be equal to it. Detailed reports have been made of a number of existing small holdings, and the Society is in communication with a number of landlords who express their willingness to cut up their land for small holdings. This land the Society is having examined by experts, and reports made upon it as to its suitability; the Society then does its best to secure suitable tenants for the landlords, and create a local demand for small holdings. Lectures are being arranged in many parts. Mr. W. A. Moore is secretary of the Society, which has offices at 10 Adelphi Terrace, London, W.C. The minimum annual member's subscription is 10s., and this is practically the only qualification necessary. The Society also has country members, who are described as "associates" and who pay no subscription, but merely help the movement and provide the Society with local information and assistance.

THE POSTAL RATES TO CANADA

NO better authority than that of the Canadian Society of Authors is needed for the statement that during the last fifteen years United States periodicals have almost entirely displaced British periodicals in Canada, owing to the low rate of postage charged by the American Government. The Society is therefore urging upon the Postmaster-General of Great Britain the desirability of securing a cheaper postal rate on newspapers and periodicals between the home country and the colonies.

The subject has also been debated recently in the Senate of Canada, when Sir George Drummond moved a resolution to call the attention of the Government to the discrimination in favour of American and against British periodicals in Canada, and to affirm the principle that postal charges on periodicals within the Empire should be lower than those on matter passing between it and any foreign country. The debate was also taken part in by Senator Scott, Sir Mackenzie Bowell, and Sir Richard Cartwright, all of whom agreed with Sir George Drummond in his attitude, deprecated the advantage afforded to the American publisher over his British competitors, and regretted the persistence of the British Government in refusing to aid in removing the discrimination against the latter. "If Canada was not really the loyal country it is," said Senator Scott, "we should long before this have been thoroughly impregnated with the United States sentiment. Go into the reading-rooms and into our family circles, and you find United States newspapers and magazines everywhere, simply because such a tax is attached to British periodicals that it is quite impossible for the Canadian people to subscribe to them." The *Toronto Globe*, in an article on the debate, states that as a matter of fact many magazines "are sent from the United States into

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Canada as freight, and are distributed there by agents, the country receiving little or no revenue from their circulation. It would be easy to make these dutiable, and go some way toward equalising conditions as between British and American magazine publishers. Those sent into this country by mail pay no postage to our Government, being carried free under the postal convention of 1875. To cancel this convention and put the country under the international postal union would considerably reduce the annual deficit of the post office department, which at present handles an immense volume of foreign periodical literature at the expense of Canada. Canadians have no objection to receiving United States magazines at a cheap rate, but they would like to get British magazines of the same classes at no greater cost. It certainly does not tend to promote either Imperial feeling or British trade in Canada to have British periodicals handicapped in their circulation while American magazines with their advertisements are freely distributed at our expense. The Canadian Government, which forced on ocean penny postage, should be equal to finding a remedy that would be at once popular and effective."

THE TELEPHONE'S NEW USES IN FARM LIFE

SIX or seven years ago a telephone company decided to establish an exchange at Belle Plaine, Iowa, a railway town of about 3700 people, surrounded by a good agricultural country of the Iowa Corn Belt type. Connection with twenty telephones was guaranteed, but the company was very doubtful whether so many subscribers could be secured. Now the exchange has nearly five hundred instruments, and the number is constantly increasing. Within the last two years more than two hundred telephones were put in. And what is true of this little town is true of hundreds of other towns throughout the Central West. Some towns of the same size can show a much faster growth in the number of telephones.

But besides the five hundred "city" telephones in Belle Plaine, there are six toll lines extending to near-by towns within thirty miles, and there are twelve farmers' lines, all centreing at the exchange. By switches at other points about one thousand farmers can be reached. The rural population of the country is about 60 per cent. of the total. Belle Plaine, with its surrounding territory, has about 10,000 inhabitants. Thus there is a telephone to every two families, and it is possible to "get" nearly any one over the telephone. The rural lines and instruments are usually owned by the farmers themselves. In getting some of these rural lines started, business men of the town took stock in the constructing company, simply to have the lines built, because enough farmers would not become interested. But the lines had been in operation only a short time when the farmers bought up the stock.

On these lines a number of instruments, sometimes thirty or more, are connected with a single wire. Each subscriber has a different ring, or "call," and the wires are in use nearly all the time. Of course, any subscriber can pick up his receiver at any time and hear whatever conversation may be going on over the line. This, unfortunately, has led to eavesdropping and has even resulted in neighbourhood quarrels.

The toll lines are direct wires from one village or town to another, and, like steam railways, are used for through business. These are the most profitable lines. The telephone business differs from almost any other, in that the larger the number of instruments installed, the greater the proportionate cost per instrument. In most enterprises, the larger the establishment (up to a certain point), the smaller the proportionate cost of the units of machinery. The unexpected growth of the Belle Plaine exchange has been a great surprise, and has prevented it so far from paying dividends, for all the profits have been necessary to increase the capacity of the system. The rapid increase in cost was caused partly by the duplications necessary in the switchboard, and partly by the fact that the number of operators required on the switchboard increased faster than the number of instruments in the exchange. The larger the number of telephones, the more use is made of each one, and subscribers are learning to use the telephone more and more.

Nearly every day some one invents or discovers a new use for it. One day the girl at "Central" received this message: "Hello! Say, Central, I have put the receiver of the 'phone in the baby's cradle, and if she wakes up and cries, call me up at number seventy-one."

It must have been an unusually absent-minded woman who sent in the message: "Oh, Central! Ring me up in fifteen minutes, so that I won't forget to take the bread out of the oven."

If some one finds it necessary to take a train, the operator at the exchange will receive some such message as this: "Central, ring me up in half an hour before the 2.17 train in the morning. See if it's late before you call me, please."

Go into the exchange during a "rush period"—say, at nine o'clock in the morning—and you will see the telephone girl stand up, push her chair into a corner, and "throw" the plugs with which connections are made as fast as her arms can fly, for an hour at a stretch. All she will have time to say to you will be, "Every woman in town is ordering things for dinner."

There are about thirty subscribers who are called regularly every morning by the telephone instead of by an alarm clock. The "Central" girl is supposed to know the time of all railway

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trains, and if a train happens to be late, how many minutes behind time. She is often asked the time of day, because some one has let the clock run down. When there is an alarm of fire, "Central" is supposed to know where it is. The exchange is just across the street from the fire-house, and fire alarms are often telephoned in—to the saving of valuable time.

At the end of a long, cold drive on a raw autumn day the writer was met at the gate by a farmer friend, with the words, "Come right in. The wife has some hot coffee ready for you. We knew you were coming. Miss Rankin seen you go by, and she just telephoned to us."

Sometimes the rural telephone has been used to stop travellers less willing to be stopped. There are sections where chicken stealing has become a lost art, because the rural telephones make it possible to block every avenue of escape as soon as the crime is discovered. Many industrious chicken thieves, and some bolder offenders, have been caught "red handed" through telephone messages which have prompted farmers to meet the malefactors with shotguns on the highway.

A farmer's wife, on a rural telephone which had been in operation only a few months, was asked how she liked the telephone. She naïvely answered, "Well, we liked it a lot at first, and do yet, only spring work is coming on so heavy now that we don't hardly have time to listen now."

Together with rural free delivery of mail and interurban railways, rural telephones are fast destroying the loneliness and isolation of farm life in the United States.

AN INTERNATIONAL CHARITY CONGRESS

THE fourth International Congress of the Public and Private Assistance Association is to be held this year during the autumn in Milan. This was arranged in 1900, when the Congress met in Paris.

The idea of this International Association is, that on account of the gradual development of the moral and material life of the people of all civilised nations, public and private charity and relief have now a social function to perform which is not in accordance with the ideas of the past.

"In former times," as the invitation to this Congress explains to us, "individual impulse regulated the principles of charity; at present it is social obligation which organises and governs the administration of charity and relief. Formerly it was sentiment which led on to pity, while nowadays Reason urges humanity on to the exercise of doing good, not so much for the advantage of individuals as in the general interest. The spirit of human fraternity and of moral and economic improvement remains the basis of every deed of philanthropy, but the means to accomplish the end one has in view are no longer what they were in days gone by. The questions to be discussed at this Milan Congress will form so many milestones along this new Road of Light, and if the results are to be of real utility and efficacy, it is necessary that all persons who have made a study of this science, and all societies appointed either by the Government of their respective countries or by the desire of their fellow-citizens to administer charity and relief, should bring to this International reunion the tribute of their experience and their studies."

Among the problems to be discussed are the following:

(1) The question of relief to foreigners, and the absolute necessity of an international agreement on this subject. (Proposition of the Committee of the Italian National Congresses, constituted at Bologna, and of M. Emile Robert of Belgium.)

(2) The professional education of the assistants of the Public Charity Administration. (Proposition of M. Münsterberg of Berlin.)

(3) The various institutions for the protection and aid of young girls and women alone in the world. (Proposition of M. Ferdinand Dreyfus of Paris.)

(4) The various measures to be taken, or that are taken, in different countries against infantile mortality. (Proposition of M. Paul Strauss, Senator, of Paris.)

(5) By what systems and with what limits insurance and provident economy could and ought to replace and complete the functions of charity and public assistance, with the help of the institutions which are at present fulfilling these functions. (Proposition of the Committee of Bologna.)

Mr. Loch of London has been asked to undertake the compiling, on a basis common to several countries, of statistics showing the administration of assistance and charity during the last half century.

Any one interested in the above subject who wishes to know more about the Congress will receive all particulars on writing to the Secretary of the Congresso dell' Assistenza Publica e Privata, Palazzo Municipale, Milano, Italy.

CORRECTION.—By a slip of the pen, the photograph of Mr. Douglas Gilchrist in our April issue bore the title "Principal of Armstrong College." Mr. Gilchrist is, of course, Professor of Agriculture, or head of the Agricultural Department, at Armstrong College, which is the University College of the North of England in connection with Durham. The Principal of Armstrong College is Sir Isambard Owen.

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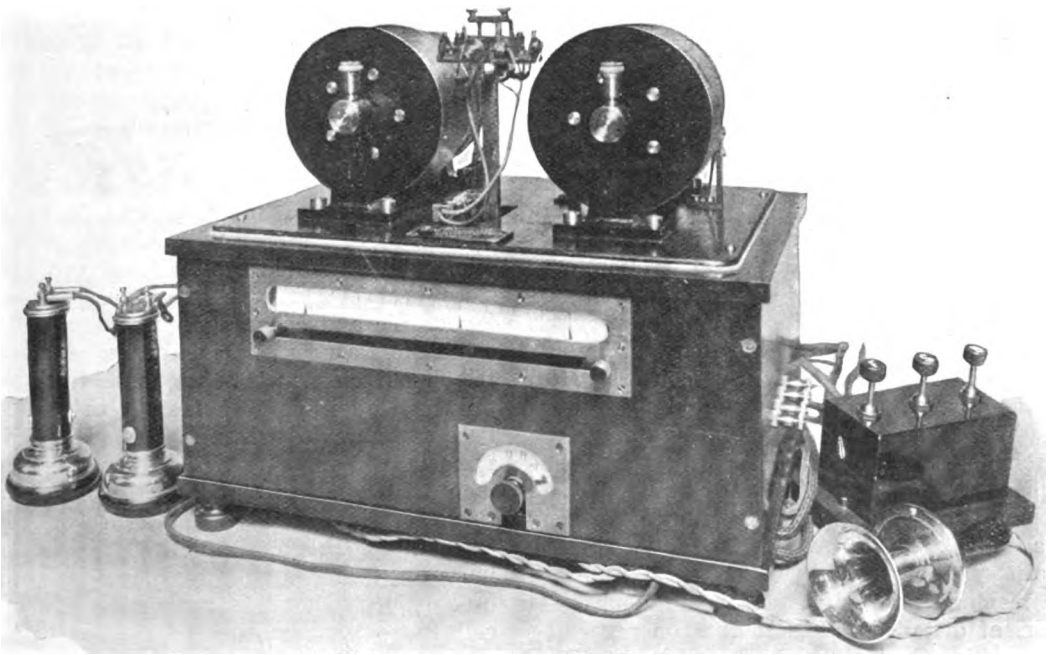
A GREAT TELEPHONIC DEVELOPMENT

THE TELEGRAPHONE

IN an article entitled "New Methods of Office Work," in the April number of THE WORLD'S WORK AND PLAY, reference was made to a remarkable recent development of telephoning as evidenced in an invention called the Telegraphone. A more detailed description of this important scientific addition to our telephonic resources will be found of especial interest to business men, for in these days of intense competition every improved means of accelerating office methods and economising time should be taken advantage of. The Telegraphone is more than an invention; it is a discovery; it brings into operation a new force in the workings of business. It is the outcome of a long series of experiments carried out by Waldemar Poulsen, a well-known Danish electrical engineer, and was shown to King Edward and Queen Alexandra on their last visit to Copenhagen, when the King remarked, "I am much interested in having seen this wonderful machine and feel sure it will be of great benefit and value."

What the Telegraphone is capable of accomplishing may be briefly stated: Mr. J. Gavey, Engineer-in-Chief to the General Post Office, in a paper read before the Institution of Electrical Engineers, described it as an invention of the greatest scientific interest, "by which a telephone conversation can be permanently recorded on a steel wire, and reproduced at any time." It can be used as a telephone recorder by simply connecting it, by means of a switch, with the telephone. When that has been done, it will record the complete conversations from both ends of the line, which conversations can be repeated at will, kept for any length of time, and obliterated when desired. Furthermore, any subscriber to the telephone system, on leaving his home or office for a time, only requires to switch on his Telegraphone, and any message that comes along the line during his absence would be registered upon it, so that on his return he would be able to hear such messages just the same as if he had been in the office when they first came through.

The Telegraphone is also of very great utility in recording correspondence dictated into it. This record, which is impressed on an extremely thin light steel disc, can either be retained upon the machine, to be transferred to paper at convenience, by the typist, between whom and the instrument telephonic communication can be easily established, or it can be detached



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from the machine and sent by post to the possessor of a similar instrument, to whom it will be as audible as if it had been originally recorded on his own machine in his own room.

Indeed, the uses to which the Telegraphone can be put are almost endless. It can be used to effect the distribution, by ordinary telephonic means, of items of news, speeches, market quotations, vocal or instrumental music, sermons, &c., to any number of persons simultaneously, whether collected at one spot or scattered.

In the words of Mr. Gavey, "As the band rushes by in the course of its revolutions it picks up the magnetism from the speaking Telegraphone circuit, next it reacts on the electro-magnets connected to the telephone and causes them to speak, and, finally, on passing under the electro-magnet, through which a steady current is flowing, the whole of the impressed magnetism is neutralised and the band wiped clean, so to speak, and rendered ready to receive a fresh impression." It is under such perfect control, and does its work so accurately, that it gives no trouble.

In the base of the machine there is an indicator, which shows how much wire has been used, and how much remains unused. There are also two pointers, which can be set anywhere, so as to mark off a given portion of the wire. A dial switch is also provided, which, in the case of what is known as the Dictation Telegraphone, gives three positions—Dictation, Hearing, and Typist — in each direction of rotation. When the switch is set at Dictation, the user can speak into a microphone transmitter and dictate correspondence, speeches, statements, or reports, which can afterwards be repeated to the speaker by setting the switch to Hearing. To prevent the superposition of one speech upon another, the Dictation connection always brings into action the obliterating magnet, which wipes out all previous records. On setting the switch to Typist, the machine comes under the control of an amanuensis, who may be situated in another room at a distance, and is provided with a switch box similar to that of the owner. The Typist presses the Forward button and takes it direct from the instrument. There is a noteworthy point in the action of the Typist's stop-button; when this is pressed the machine not only stops, but runs back a sufficient distance to ensure that on restarting the machine the last few words will be repeated. Should the Typist require to compare the written copy with the record of the Telegraphone he presses the Backward button and runs the machine back until the beginning of the record is reached. If by chance the machine should be omitted to be stopped, it simply runs on to the end of its range and then stops automatically.

It is not to be wondered at that this marvellous invention should have been much discussed by the leading scientific men of our time, who foresee in it a great labour-saving device which is destined to be of very great service to the world of business. Sir William Preece regards it as not only "beautifully designed, but based on beautiful principles. There is nothing, to my mind, so marvellous as the continual exchange through electrical actions and magnetical actions, through steel, and through circuits of these curious changes of position, form, motion, and shape that we sometimes call electrical and sometimes magnetical, but are all brought out in this beautiful instrument of Mr. Poulsen's." Mr. W. T. Hamer says, "I certainly never have heard anything in the way of a speaking machine that will touch the Telegraphone." Mr. Dane Sinclair, late Engineer-in-Chief to the National Telephone Company, observed, "I was very much impressed by this invention, and believe with Mr. Gavey, that there are large possibilities in its future." Lord Kelvin has also spoken of the Telegraphone in terms of the highest praise.

It is especially interesting at this juncture to learn that the Telegraphone is now being introduced into Great Britain, and that there is every prospect of its becoming not only a great scientific, but a great commercial, success. Offices have been opened by the Telegraphone Syndicate in London, at 28 and 29 St. Swithin's Lane, E.C., where machines can be inspected and tested at any time. Already numerous offices have adopted the machine, and from all sides the reports of results are of the most favourable and encouraging character. It has established a new principle and a new force in telephonic science which are bound to come into universal adoption. In fact, it only needs to become known to be approved. It will be an important factor in the commercial development of the near future, and the inventor and those associated with him in launching it before the public can hardly fail to reap a golden harvest. There is nothing to prevent its being quickly utilised. It is not costly, it does not call for expert knowledge to use it, and it performs its work with ease, accuracy, and speed. It is an invention marking such a notable improvement that its general adoption can be but a question of a short time.

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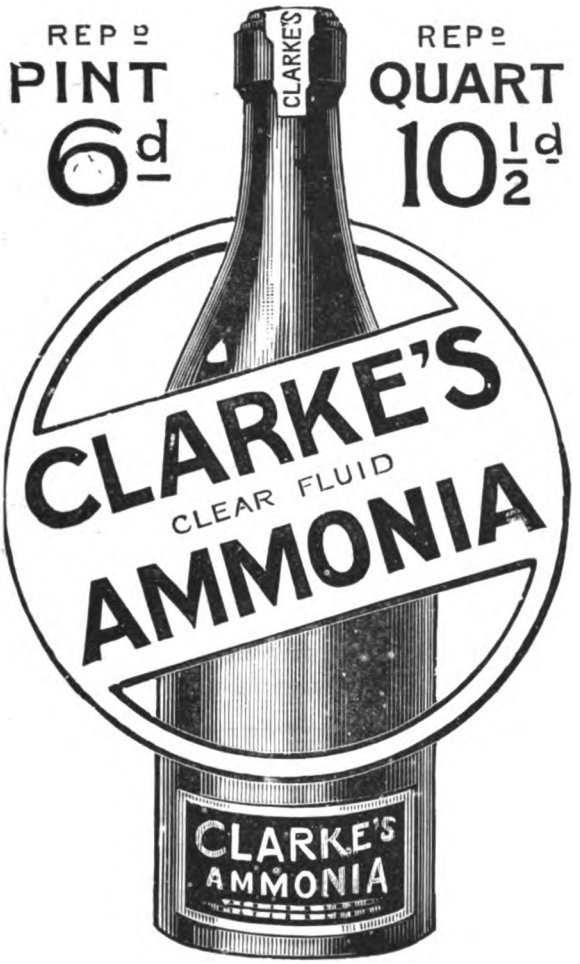

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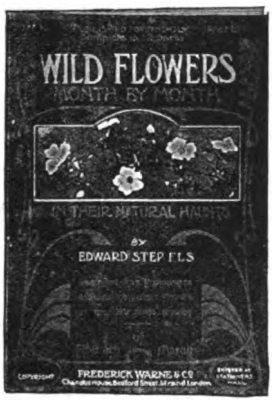

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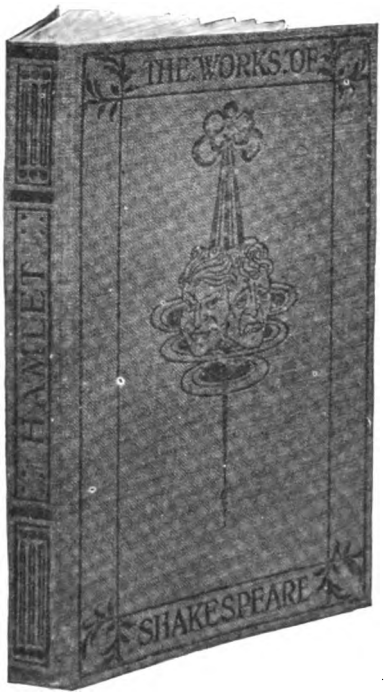

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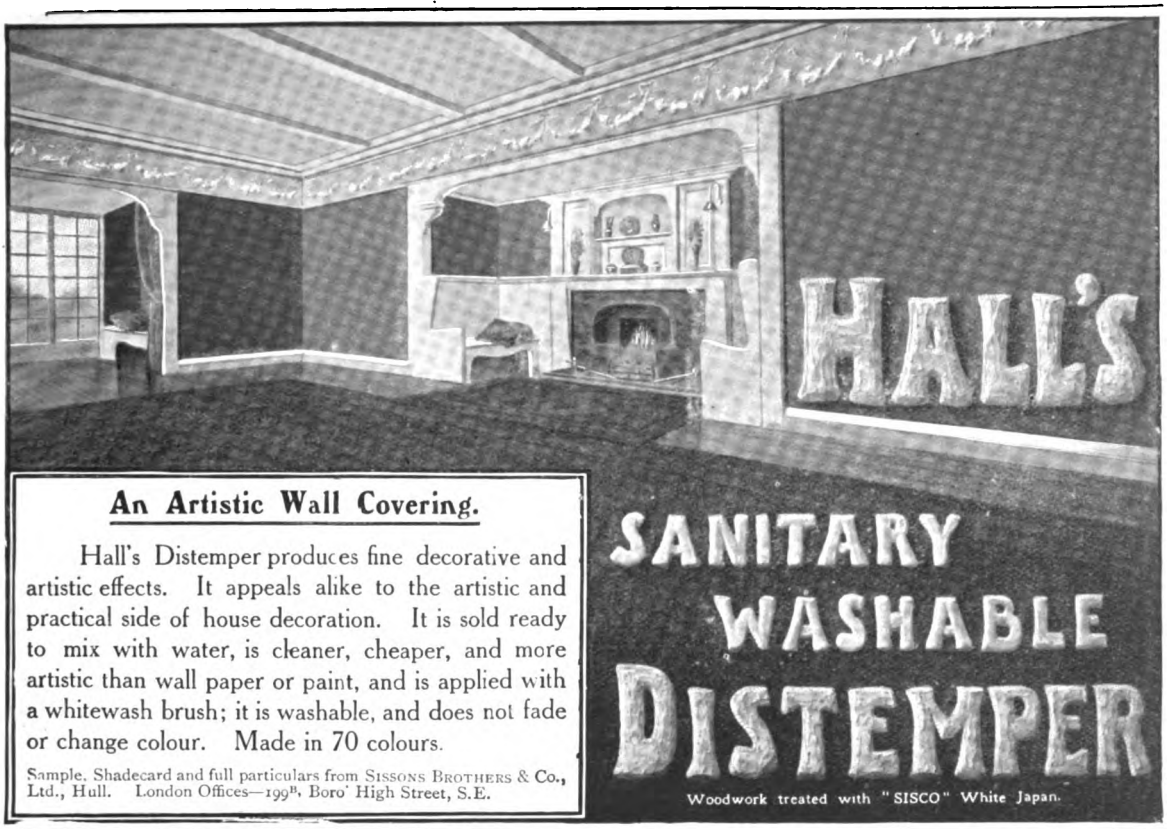

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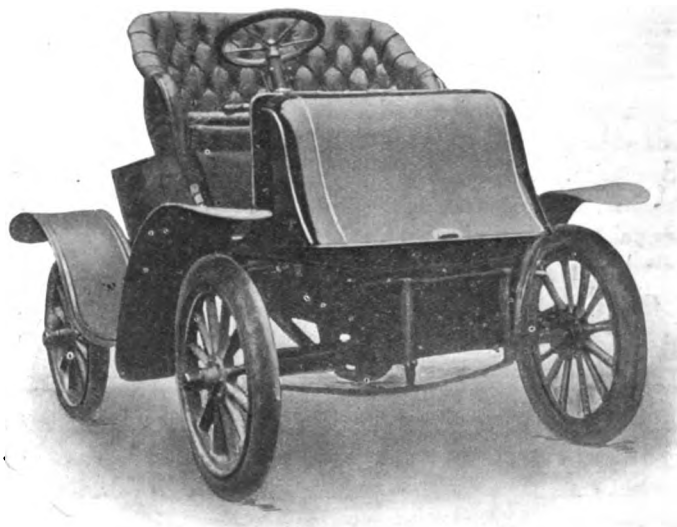

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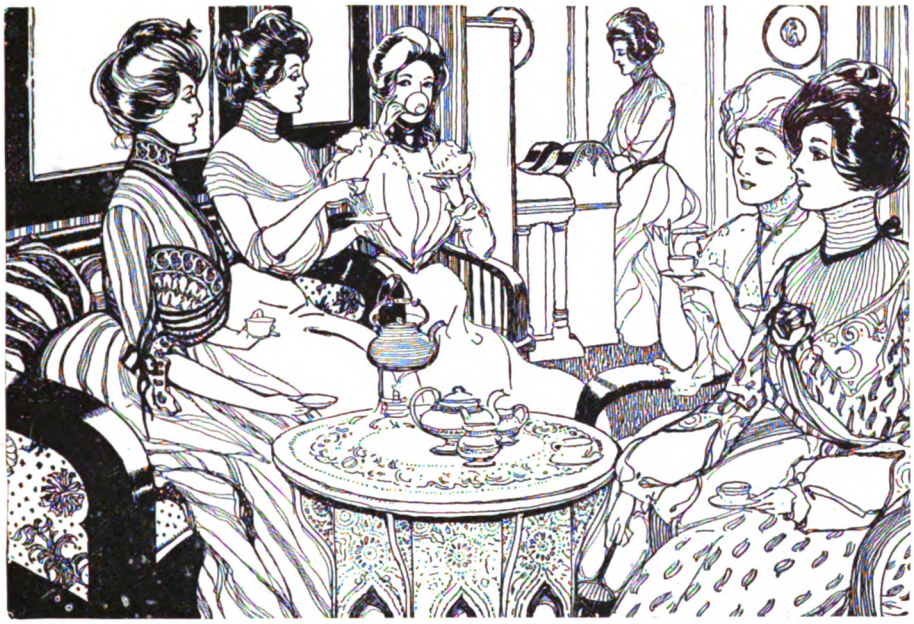

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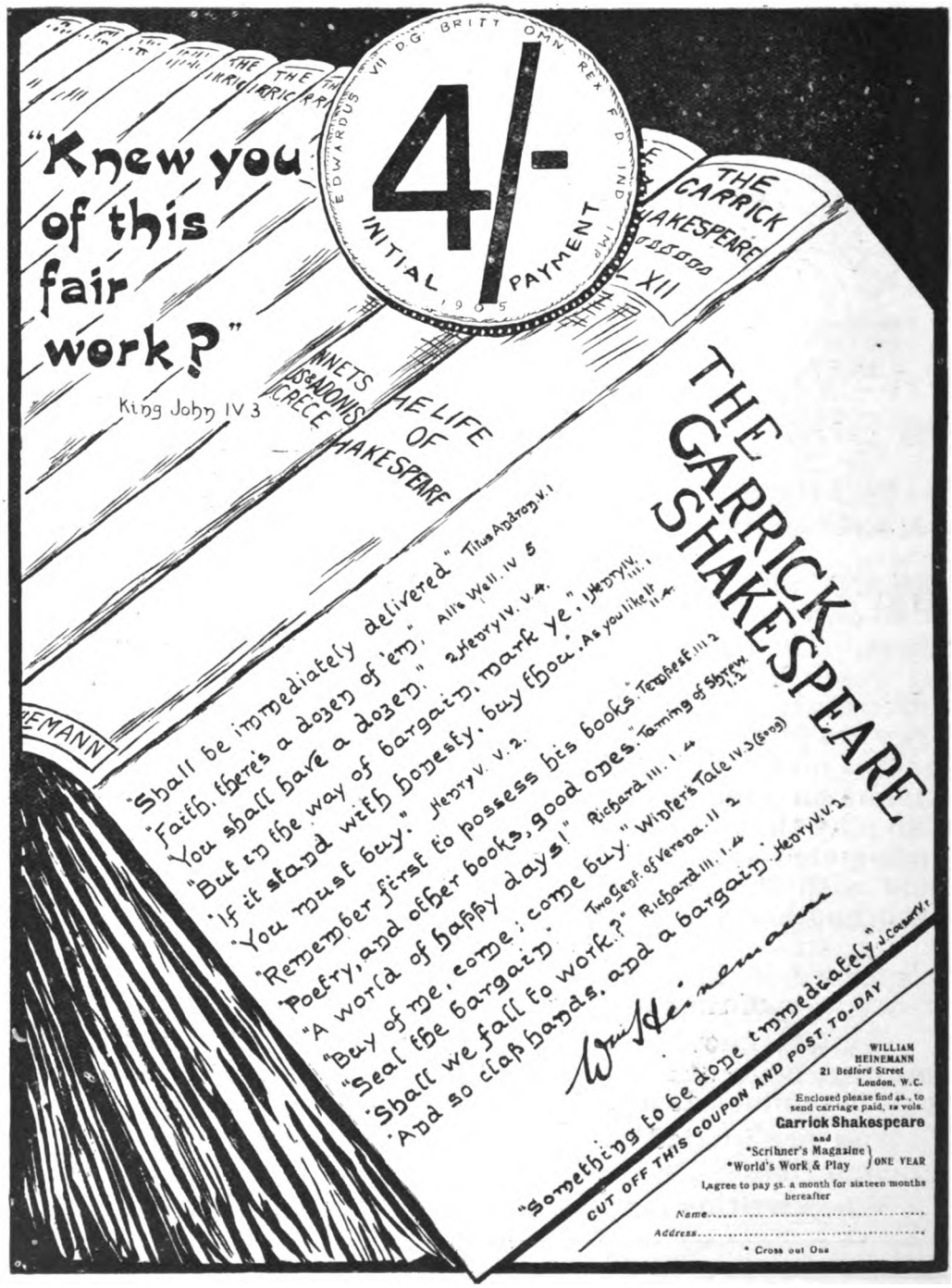
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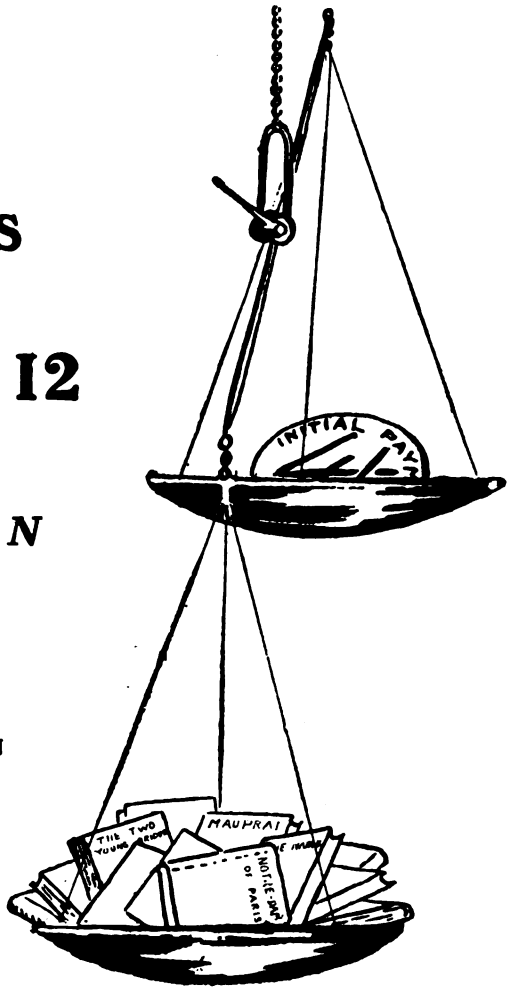

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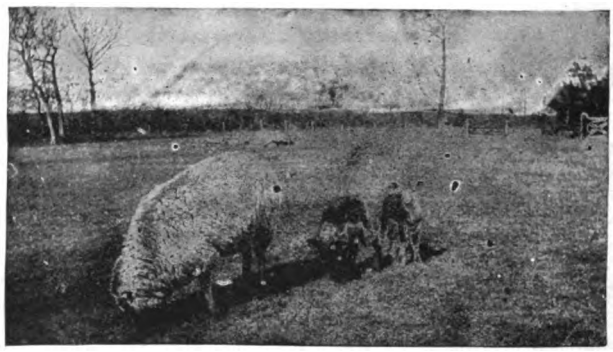

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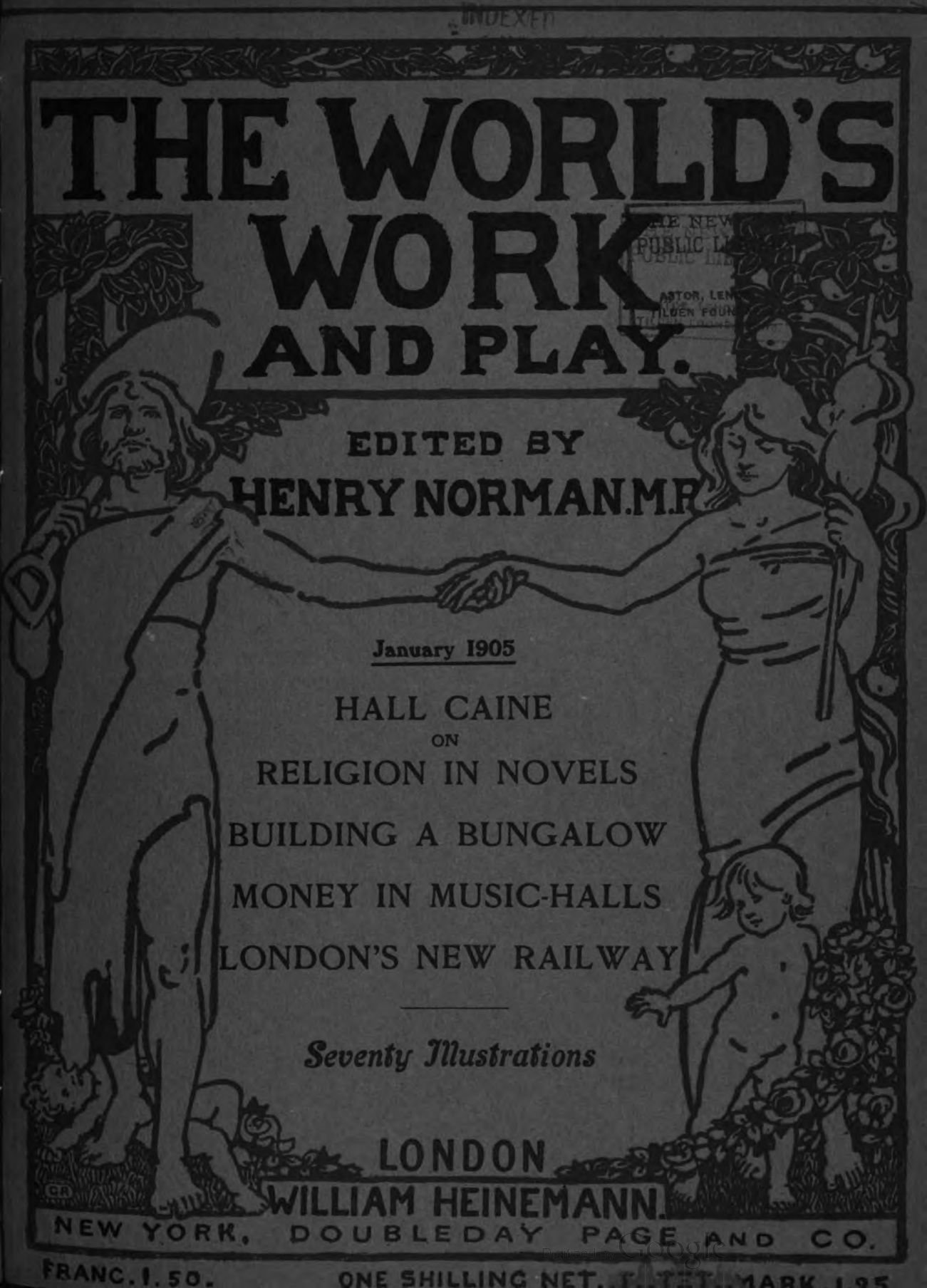

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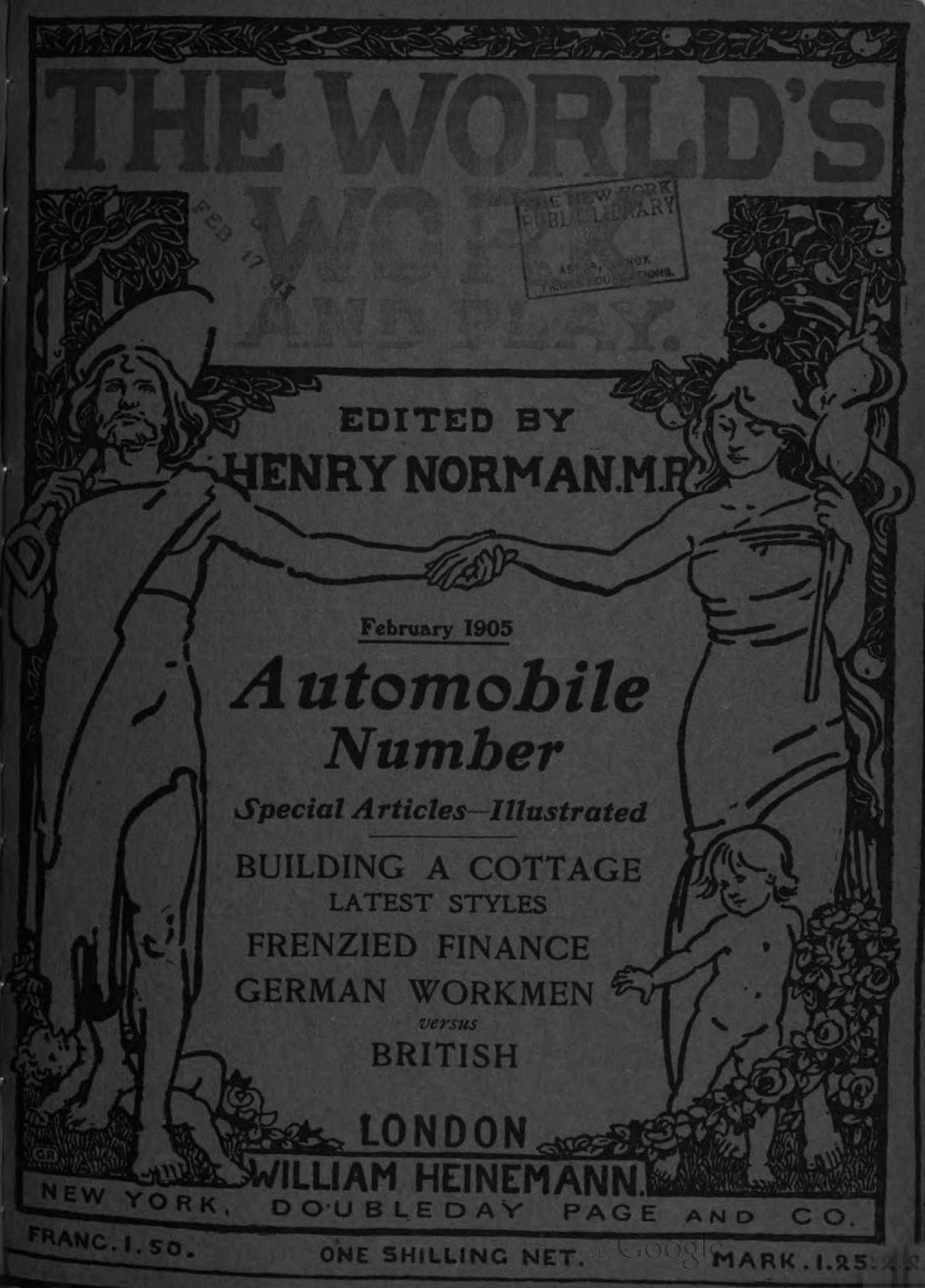

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The *Irish Technical Journal* is the name of an educational monthly, born about six months ago. It is edited by Mr. R. Macdonald, M.A., B.Sc., a gentleman of considerable reputation in Irish educational circles. The publishers are Messrs. Browne and Nolan, Ltd., Dublin, and the published price one penny. The venture is

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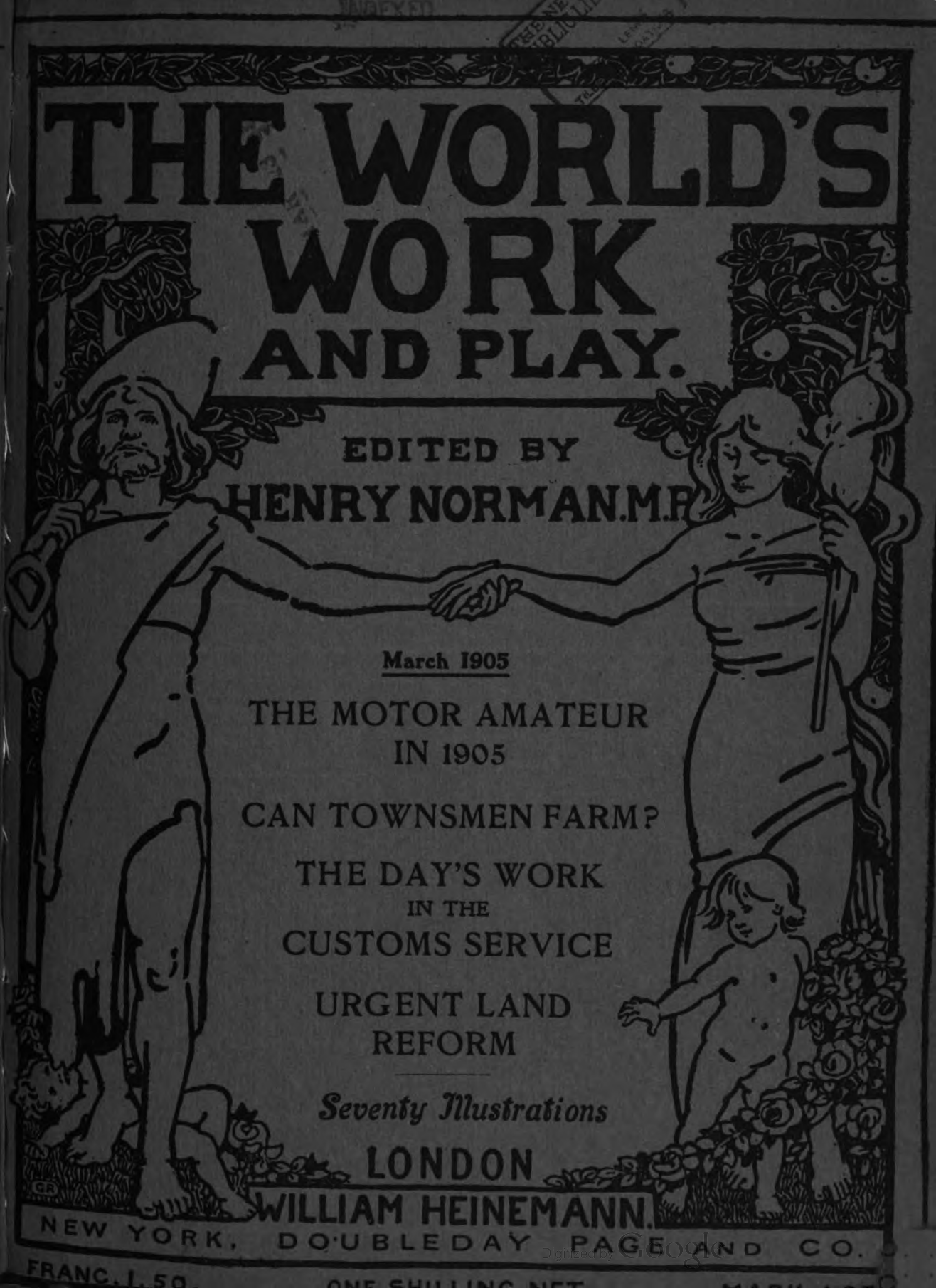

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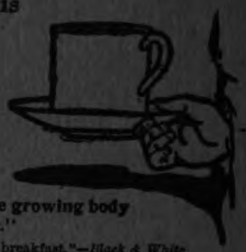

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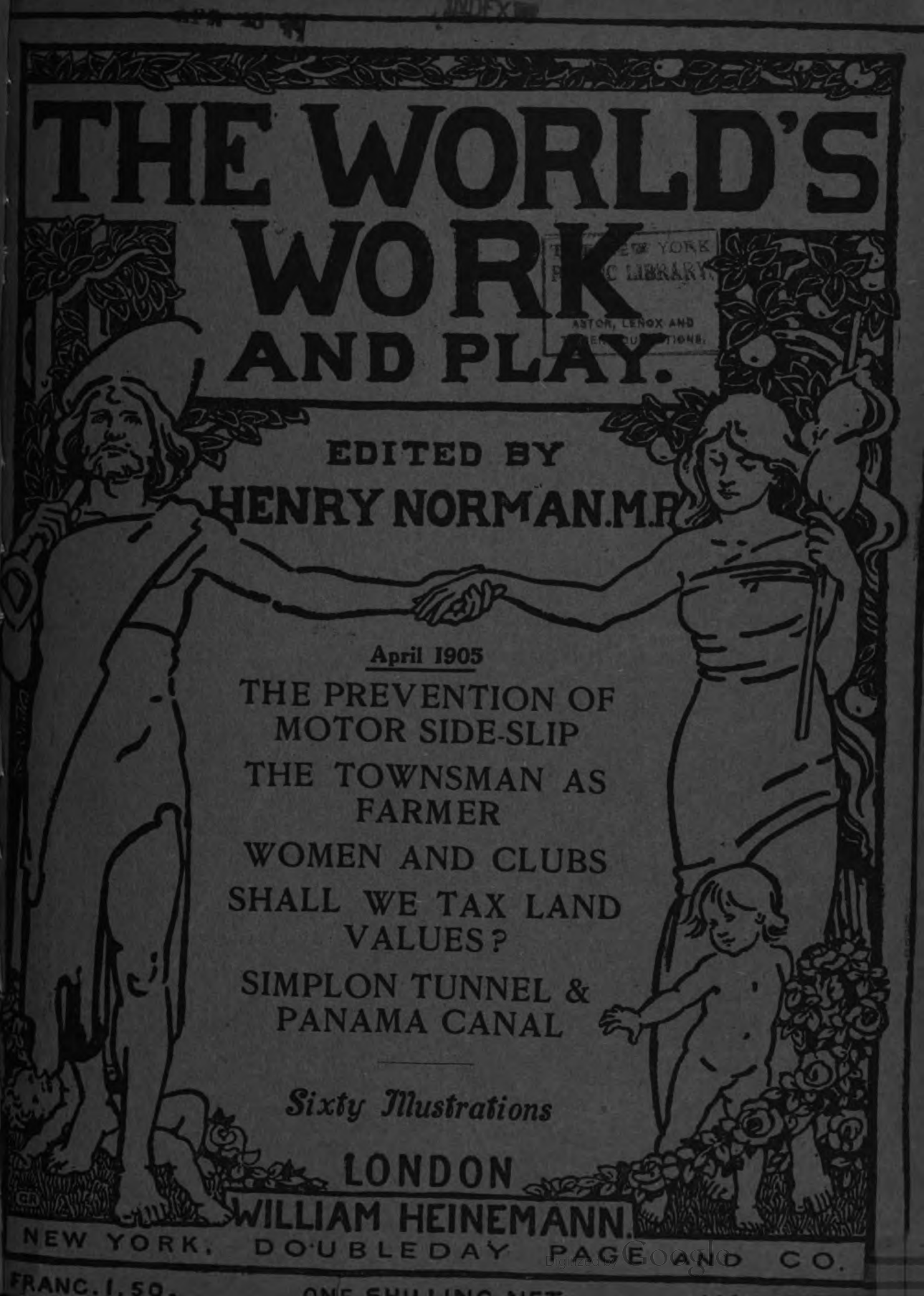

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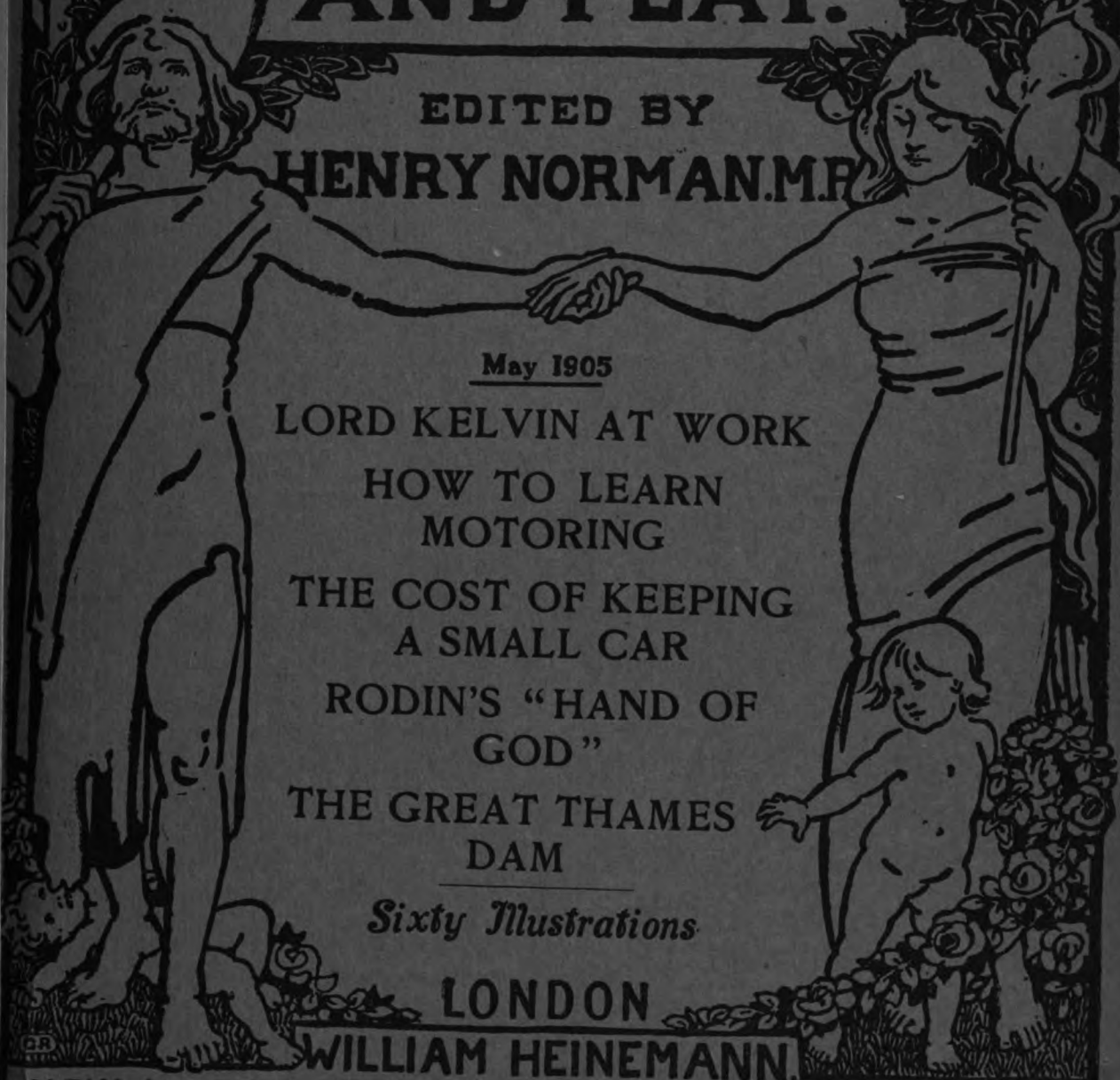

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